Ministry of Higher Education & Scientific Research

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1st International Conference on Optoelectronics, Materials & Renewable Energy

ICOMRE'22

12-13 December 2022

El Oued, Algeria

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Title	Study of physicochemical properties of greenly synthesized iron oxide nanoparticles
Abstract	In this paper, iron oxide nanoparticles were greenly synthesized using Asphodelus tenuifolius Cavan.L aqueous extract as a reducing agent. The synthesized samples of iron oxide nanoparticles were characterized by XRD, SEM, ATR-FTIR, and UV-Vis techniques. Moreover, the characterization of Asphodelus tenuifolius Cavan.L aqueous extract has been conducted. The physicochemical properties of greenly synthesized NPs such as phase, size, and morphology have been studied, Where found results showed that, after the annealing of synthesized iron oxide NPs for 2h in 500 °C, two phases α−Fe2O3 and γ−Fe2O3 were formed with grain sizes of about 26.92 and 30.05 nm, respectively. Furthermore, the formation of a single-crystal-like bipyramids shape has been illustrated by SEM. The direct and indirect band gap energies of α−Fe2O3 and γ−Fe2O3 phases have been estimated. α−Fe2O3 phase showed an indirect band gap energy of 1.80 eV, otherwise, γ−Fe2O3 showed a direct band gap energy of 2.26 eV. Accordingly, it was able to deduce that both α−Fe2O3 and γ−Fe2O3 phases are semiconductors. Additionally, the characterization of Asphodelus tenuifolius Cavan.L aqueous extract has been conducted. Where, obtained findings show that this plant extract is rich in polyphenols, flavonoids, and condensed tannins. Furthermore, it showed a high total antioxidant activity and %DPPH radical scavenging activity.
Keywords	green synthesis Asphodelus tenuifolius Cavan.L iron oxide NPs single-crystal physicochemical properties

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Title	Green Synthesis of Nanoparticles from Medicinal Plants
Abstract	Green synthesis technology is used to create nanoparticles from medicinal plants that are physiologically safe, cost-effective, and environmentally benign. ZnO NPs with a wide range of potential uses, particularly in the biomedical area to improve antibacterial activity were ecologically synthesized. In this work, an aqueous extract of the Retama sphaerocarpa (L.) plant was used as the biological reduction and stabilizing agent for the synthesis of ZnO NPs from zinc acetate dihydrate (Zn (CH3COO)2).2H2O. UV-Visible spectroscopy, infrared spectroscopy, and X-ray diffraction analysis were used to analyze the resulting Nano powder. The crystalline nature of the nanoparticles and particle size validated by X-ray diffraction experiments. The UV–Vis absorption spectra showed an absorption peak at 370 nm. The existence of metal-oxygen groups was confirmed by FTIR spectral analysis. ZnO NPs' biological properties were also studied, and they showed high antibacterial activity against Staphylococcus aureus (S. aureus). The results of this work show that Retama sphaerocarpa (L.) is a straightforward and environmentally friendly way the synthesis of ZnO NPs for pharmaceutical application as antibacterial formulation.
Keywords	ZnO, nanoparticles, green synthesis, Retama sphaerocarpa, antibacterial

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Title	Influence of precursors on ZnO films structural, microstructural, optical properties and copper ions removal
Abstract	ZnO films were prepared by spray pyrolysis technique using zinc acetate (ZAC-0.2), zinc chloride (ZCL-0.2), and dehydrated zinc nitrate (ZNH-0.2) precursors. The structure, microstructure, and optical properties of these materials are studied as well as the efficiency to adsorb copper ions. From the obtained results, all ZnO films belong to hexagonal Wurtzite structure and the ZAC-0.2 sample showed the highest transparency between 400-800 nm wavelengths, the highest Urbach energy (Eurb) of 84.85 meV, and the highest efficiency to remove 52 % of copper ions in aqueous solution.
Keywords	ZnO Thin Films; Precursor Ion; XRD Study; FTIR; UV-Vis; Adsorption

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Title	Preparation , Characterization of Diatomite Coated Fe(OH)2 Nanoparticles and application in Photocatalytic Degradation of Organic pollutants
Abstract	Silica coated hematite nanoparticles " TDF " composite as catalyst and characterized in this study. SCHN was made a surface modification treatments including Iron (III) nitrate nanohydrate Fe(NO3)3.9H2O deposition on raw diatomite .In the Fe(NO3)3.9H2O treatment, surface silica of diatomite and TiO2 degussa P25 were partially dissolved in The iron (III) nitrate nanohydrate Fe(NO3)3.9H2O by means of xray fluorescence (XRF), scanning electron microscopy (SEM), thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), and UV-visible diffuse reflectance spectroscopy (DRS).The surface area of SCHN is 855 m2/g.The product of this procedure was named " TDF ". (pHPZC) values to 6 for Silica coated hematite nanoparticles with gap band was Eg= 1.1 eV by UV-visible DRS technique. Photocatalytic activity of Diatomite biosillica – Fe2O3 /TiO2 hybrid film was studied towards Olive Green B under UV irradiation. The mixture Diatomite biosillica- Fe2O3 / Fe(OH)2 / TiO2 gave a better colour remove rate about 97 % at pH=4. The Objective of this work is the industrial textile dye in wastewater.
Keywords	hematite, Silica nanoparticles, Iron, gap band, wastewater.

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Title	Analysis Of Melt Pool Instabilities During Stainless Steel Selective Melting Process
Abstract	In this paper, a computational fluid dynamics (CFD) approach under the framework of the volume of fluid (VOF) and melting/solidification models for selective laser melting process at the mesoscale is presented using the 316L stainless steel material. The simulation of the thermal behavior and the dynamics of the molten pool, also the morphology of the solidified track as function of the scanning speed (0.7, 0.9, 1.3, 1.5, and 2.0m/s) was studied for fixed values of laser power, spot radius and powder bed thickness (130W, 60µm, 40µm). The main results showed that, as the scanning speed increases the width, the depth and the height of the solidified track decrease. Additionally, a periodic separation of the molten pool owing to the surface tension caused periodic humps at higher laser scanning speed and ripples at lower ones.
Keywords	additive manufacturing, selective laser melting, track, solidification and melting, instability, stainless steel

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Title	An experimental analysis of open-hole composite damage by Digital image correlation.
Abstract	. In the present work, an experimental study is carried out using the digital image correlation (DIC) technique to analyze the damage and behavior of woven composite carbon/epoxy under tensile loading. The tension mechanisms associated with failure modes of bolted joints in advanced composites are studied, as well as displacement distribution and strain distribution. The evolution value of bolt angle inclination during tensile tests was studied. In order to compare the distribution of displacements and strains along the surface, figures of image mapping are made. Several factors that are responsible for the failure of fiber-reinforced polymer composite materials are observed. It was found that strain concentrations observed in the specimens can be used to identify full-field damage onset and to monitor damage progression during loading. Moreover, there is an interaction between laminate pattern, laminate thickness, fastener size and type, surface strain concentrations, and out-of-plane displacement. Conclusions include a failure analysis associated with bolt angle inclinations and supported by microscopic visualizations of the composite specimen. The DIC results can be used to develop and accurately validate numerical models.
Keywords	Carbone, woven, damage, digital image, bolted joint; the inclination of angle.

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Title	Study of physicochemical properties of greenly synthesized iron oxide nanoparticles
Abstract	In this paper, iron oxide nanoparticles were greenly synthesized using Asphodelus tenuifolius Cavan.L aqueous extract as a reducing agent. The synthesized samples of iron oxide nanoparticles were characterized by XRD, SEM, ATRFTIR, and UV-Vis techniques. Moreover, the characterization of Asphodelus tenuifolius Cavan.L aqueous extract has been conducted. The novelty of this paper lies in highlighting the influence of mediating plant extract on the physicochemical properties of greenly synthesized NPs such as phase, size, and morphology. Found results showed that mediating plant extract has a clear effect on studied physicochemical properties. Where, after the annealing of synthesized iron oxide NPs during 2h in 500 °C, two phases α−F e2O3 and γ−F e2O3 were formed with grain sizes of about 26.92 and 30.05 nm, respectively. Furthermore, the formation of a single-crystal-like bipyramids shape has been discovered by SEM. The direct and indirect band gap energies of α − F e2O3 and γ − F e2O3 phases have been estimated. α − F e2O3 phase showed an indirect band gap energy; 1.80 eV , otherwise, γ − F e2O3 showed a direct band gap energy: 2.26 eV .
Keywords	green synthesis, Asphodelus tenuifolius Cavan.L, iron oxide NPs, and single-crystal

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Title	Ag2O/TiO2 nanocomposites for improved photocatalytic and antibacterial performance
Abstract	TiO2 was modified by the deposition of Ag2O nanoparticles to increase the photocatalytic degradation in water under UV–C (λ=254 nm) and UV–A/visible light irradiation (380–800 nm) using pure and tap water. Several loadings of Ag2O were deposited on TiO2, namely 0.03, 0.15, 0.25, 0.65, 1.0, 1.15, 1.35 and 1.8 wt. %. XRD was carried out to characterize the materials, Stability of the photocatalyst was observed through three consecutive reaction cycles under UV–A/visible light irradiation. In tap water, environmentally relevant concentrations of iopromide were tested (Co=50 μg L−1), resulting in a high degradation rate, while mineralization dramatically decreased because of the matrix effect. In tap water, environmentally relevant concentrations were tested (Co=50 μg L−1), resulting in a high degradation rate, while mineralization dramatically decreased because of the matrix effect. The outstanding photocatalytic activity of the Ag2O/TiO2 materials was explained by the electron trap effect exerted by Ag2O, along with the appearance of different silver species (Ag2O, Ag2O2 and Ag°) throughout the photocatalytic reaction, enhancing the mobility of the charge carriers and thus the generation of reactive species on the photocatalyst surface
Keywords	Ag2O/TiO2, XRD, photocatalytic, nanoparticles

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Title	1- Adsorption and Photophysical Properties of Fuorescein Dye over Zr-Pillared Montmorillonite 2- Removal of Imidazolium Ionic Liquids from Aqueous Solutions Using Pillared Clay
Abstract	Abstract (1): In the present study, the adsorption capacities of two intercalated smectites, Na+-PMt and Ca2+-PMt with the Zr pillar were investigated on fluorescent dye adsorption The adsorption isotherms fit well with the non-linear Langmuir isotherm model and the maximum adsorption capacities of all the materials are determined.The X-ray diffraction (XRD) was done to determined le location of the dye molecule. The pillar improves the adoption capacity towards fluorescein due to its location inside interlayer space. Interestingly, the time resolved fluorescence show that the dye is not released in solution as it is the case for the pristine clay. Abstract (2): This study aims to investigate the efficiency of pillared clay (Zr-PILC) on adsorption of model ionic liquid (Butylmethylimidazolium).The adsorption isotherms as well as the kinetic are measured. The modified clay sample were characterized in detail using X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR), thermogravimetric analysis (TGA).The XRD analysis showed the increase of basal spacing of Zr-PILC prepared from 12.22 to 16.05 Å. For the butylmethylimidazolium the adsoption capacities in not enhanced by the presence of pillar as it is the case for the pristine clay. Adsorption isotherms, displayed that the maximum adsorption capacity of Mt-Na and PMt-Na according to the Langmuir model were 54.77 mg/g and 22.70 mg/g, respectively.
Keywords	montmorillonite, Zr-pillared clay, adsorption, fluorescence.

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Title	Use of calcination residue from Chicken Egg Shells as a substitute for cement
Abstract	In this study, we have developed a new cement composed by a partial substitution of clinker by chicken egg shells ash. These substitutions were chosen by the presence of silica which can react with portlandite (Ca(OH)2). The results obtained show that these materials have, after activation, a high pozzolanicity which allows their addition to Portland clinker with a percentage of up to 45% of the mass of the clinker. The improvement of this reactivity is obtained by calcining these additions at temperatures of 750°C. This significantly reduces the CO2 emissions that accompany the production of Portland cement clinker.
Keywords	Eco-cements, CPA Cement, Chicken egg shells, Calcination, Resistance.

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Title	Advanced composite materials Study of sandwich Plate structures made of (Metal: Ti–6A1–4V/ Ceramic: ZrO2) exposed at linear and nonlinear external thermal charge.
Abstract	to study the behaviour of advanced material made of of functionally graded materials of (Metal: Ti–6A1–4V/ Ceramic: ZrO2) , a mathematical approach has used for thermoelastic bending analysis. This integral theory contains only four variable functions as against five in the case of other theories. The governing equations of are derived and resolved via virtual work principle and Navier's model. The accuracy of the proposed analytical model is confirmed by comparing the results with those given by others model existing in the literature. In addition, several parametric examples are presented to show the thermoelastic bending response of the various symmetric sandwich plates.
Keywords	Advanced materials sandwich plate thermal loads vertical displacement

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Title	Elaboration, Characterization and Corrosion Behavior of Al-10%Mo Alloy
Abstract	The elaboration in a high frequency magnetic induction furnace of the Al-10%Mo alloy was carried out using compacted pellets from pure powder mixture of Al 99% and Mo 99.99%. The microstructural and mechanical characterization of this alloy was performed by optical microscopy, scanning electron microscopy (SEM), X-ray diffraction and Vickers HV0.05 microhardness. The corrosion behavior in 3.5%NaCl solution was investigated using potentiodynamic polarization and electrochemical impedance spectroscopy. The results show that the structure of the Al-10%Mo alloy is composed of an Alα matrix with the presence of Al5Mo intermetallic in needle and plate form distributed over the total material surface. The results of the electrochemical tests show that the Al-10%Mo alloy in 3.5%NaCl medium has a corrosion potential around -900mV/ECS and a current density equal to 0.548 µA.cm-2.
Keywords	Aluminum alloy, molybdenum, elaboration, intermetallic, corrosion.

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Title	Elaboration and Electrochemical properties of Sn/SnO2 modified electrode for environmental application
Abstract	The development of an electrochemical sensor for the detection of traces of heavy metals was carried out by square wave anodic stripping voltammetry (SWASV), this method is based on a simple anodic conversion of the tin electrode into a modified Sn/SnO2 electrode. Electrochemical and physicochemical techniques were used to confirm the modification process namely electrochemical impedance spectroscopy and X-ray diffraction.The proposed sensor was validated for the detection of lead in drinking water with very satisfactory results, which indicate its suitability for use in source water monitoring.
Keywords	Sn/SnO2 electrode, SWASV, DRX, heavy metals

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Title	Water absorption and impact toughness of glass-reinforced composite materials
Abstract	Fibreglass reinforced polyester resin plates have been manufactured by the contact molding method with 20% of reinforcement percentage. Prismatic specimens have been cut to evaluate the impact toughness by applying the Charpy impact test using the principle of linear elastic fracture mechanics based on the Williams method. These specimens have been immersed in water for 30 and 90 days to study absorption effect and diffusion on the impact behavior of this material.
Keywords	Glass; polyester; impact toughness; Charpy test; water.

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Title	STUDY OF THE PROPERTIES OF INDUSTRIALLY DEFORMED AND ANNEALED COPPER WIRE
Abstract	This study is proposed within the framework of a scientific collaboration with the ENICAB electric power transmission cable manufacturing company in Biskra. The objective of this work is to study the influence of the annealing treatment on the drawing behavior and the evolution of the properties: structural, mechanical and electrical of the copper wires drawn industrially at the company ENICAB in Biskra intended for electrical wiring. . For this study, several experimental techniques of measurement and characterization allowed us to carry out this work. These are: optical microscopy, Scanning Eelectron Microscopy (SEM), Electron Back-Scattered Diffraction (EBSD), Vickers microhardness, tensile testing and resistivity measurements. The structural and textural analysis shows that the copper wires heat-treated at 260°C for 30 minutes of maintenance are made up of the same majority fibers <111> // DN and <001> // DN as the deformed wires with a homogeneity of the grain sizes. On the other hand, it is observed that the fiber <001> // DN remains predominant with a strong reduction in the intensity of the fiber <111> // DN after annealing. There is also a significant decrease in mechanical properties (hardness and mechanical strength) and electrical resistivity after holding for 30 minutes at 260°C.
Keywords	EBSD, Mechanical and electrical properties, Texture, Annealing treatment, copper wires drawn

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Title	Effect of Temperature on the Electrochemical Behaviour of API 5L X52 Pipeline Steel in Different Soils
Abstract	The Corrosion of gas transport equipment is the deterioration of steel pipelines resulting from an electrochemical reaction with its surrounding environment. This reaction causes the oxidation of iron in the steel pipe or other pipeline accessories. The present work consists of studying the corrosion behaviour of an API 5L (X52) pipeline steel in different soils (sea sand and sea water) at different temperatures (25°C and 50°C) using potentiodynamic tests and electrochemical impedance measurements (EIS). The corrosion morphology of the steel was examined by optical microscopy. The results show that the better corrosion behaviour is obtained in the sea sand solution where the corrosion potential and corrosion density are respectively: -739 mV/ECS and 1.50 µA.cm-2. The temperature has a great influence on the electrochemical behaviour of X52 steel in different soils; it increases the degradation of the steel by shifting the corrosion potential towards more negative values and increasing the corrosion current density. vThe Corrosion of gas transport equipment is the deterioration of steel pipelines resulting from an electrochemical reaction with its surrounding environment. This reaction causes the oxidation of iron in the steel pipe or other pipeline accessories. The present work consists of studying the corrosion behaviour of an API 5L (X52) pipeline steel in different soils (sea sand and sea water) at different temperatures (25°C and 50°C) using potentiodynamic tests and electrochemical impedance measurements (EIS). The corrosion morphology of the steel was examined by optical microscopy. The results show that the better corrosion behaviour is obtained in the sea sand solution where the corrosion potential and corrosion density are respectively: -739 mV/ECS and 1.50 µA.cm-2. The temperature has a great influence on the electrochemical behaviour of X52 steel in different soils; it increases the degradation of the steel by shifting the corrosion potential towards more negative values and increasing the corrosion current density.
Keywords	Corrosion, sea sand, seawater pipeline, API 5L (X52), temperature, soils, gas transport.v

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Title	Green Synthesis And Characterization Of Nanoparticle
Abstract	Nowadays, the application of nanotechnology is exponentially increasing in different therapeutic and agricultural activities, such as antibiotics, anticancer, antimicrobial agents, and bio-fertilizers [1]. One of the challenges in modern nanotechnology is the development of reliable, safe protocols for the synthesis of nanoparticales. Therefore, exploring innovative, cost-effective, non-toxic, and eco-friendly sustainable approaches should be of critical interest. So, green nanotechnology has suggested developing cost-effective and environmentally sustainable techniques to fabricate metallic nanoparticales. We reported the synthesis of MnO nanoparticales (MnO NAPs) using biological molecules of Ziziphus spina-christi leaf extract as reducing agent and characterised it by UV Vis spectroscopy and FTIR techniques. In this work, we have successfully synthesized MnO NAPs functionalized with biologically active phytomolecules of hydroalcoholic leaf extract of Ziziphus spina-christi for the first time via a robust, economic, and eco-friendly approach. The green-synthesized NAPs were further characterized using different spectroscopic techniques (FTIR, and UV–visible).
Keywords	MnO, nanopartilces, UV Vis spectroscopy, FTIR

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Title	Probabilistic notched failure assessment diagram for reliability estimation
Abstract	This paper focuses on a development of a notched failure assessment diagram as a power tool for the maintenance program and integrity of the pipelines transporting oil and gas, and subjected to corrosion attack. Internal and external corrosions defects were detected after about three decades of the pipeline service lifetime. The fracture interpolation curve is based on the SINTAP procedure as a limit state of the integrity of the corroded steel pipeline. After, the assessment point were based on the finite element method, mechanical properties, and static loading in order to identify the fracture domain, security domain, and safety domain. Then the estimation of the iso-probability of failure or iso reliability index of the damaged pipelines is performed by coupling the deterministic failure assessment diagram with FORM/SORM reliability methods. Besides, a decision support tool, in the determination of a program of preventive or curative maintenance actions.
Keywords	Notched failure assessment diagram, Probabilistic approach, Localized corrosion, Finite element method

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Title	Investigation of the wear of tungsten carbide inserts during cutting in turning
Abstract	The investigation of insert wear presents an experimental study to analyze the influence of cutting parameters during turning of a tool steel following the propagation of tool wear. The first analysis consisted in determining the wear progression at each machining time. This made it possible to estimate the approximate life of the different inserts. Thus, controlling wear variations on the machined surface and its significant impact on surface quality can improve the life and performance of the part. In this analysis, the results show that the cutting parameters (cutting speed, feed rate, depth of cut) significantly affect the values and types of wear; hence, the influence of these parameters on the roughness of the machined surface. Furthermore, the experimental results showed that clearance wear was the major and most important failure mode affecting the tool life.
Keywords	Wear, Tool life, Surface roughness, Turning, Cutting parameters.

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Title	Study of structural, optical, and spectroscopic properties of Eu3+ doped (Gd2O3/Lu2O3)- Al2O3 systems, synthesized by solid state reaction
Abstract	Europium doped (Gd1-xLux)3Al5O12 Garnet compositions are of great interest in terms of structural and optical properties; the presence of Gd3+ in these compounds provides advantages over the photoluminescence of the activator's ions (Eu3+) due to Gd's low electronegativity. The disadvantage of garnet containing Gd is that it is not formed by this ion alone because its large size prevents the formation of the pure phase, so it requires compensation with other ions such as Lutetium in order to stabilize GAG. We attempted to develop and elaborate the type (Gd1-xLux)3Al5O12 doped 5 at% Eu3+ compounds prepared by the solid-state reaction method, calcined at T=1450°C. XRD analyses have shown the presence of intermediate phases such as: Ln2O3, Ln4Al2O9, LnAlO3, and Ln3Al5O12. FTIR analyses have identified the different active internal vibration modes corresponding to the specific absorption bands of M-O (M: Gd and Lu or Al elements) associated at different frequencies of these compounds. Based on photoluminescence results, Eu3+ is also an attractive ion in terms of structural symmetry in the host materials luminescents corresponding to the 5D0- 7FJ (J=1,2) emission transitions under 360 nm wavelength excitation.
Keywords	Europium; Solid State Reaction Method; XRD; FTIR; Photoluminescence.

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Title	Structural and Optical properties of LiGd1-xLux(WO4)2 co-doped Yb3+/Er3+
Abstract	Tungstate crystals with the general formula A(RE)(WO4)2, where A is the alkaline element; K, Li, Na, Cs and Rb; the (RE) is trivalent element such rares earth have attracted a great attention, for their great optical properties and high performance for many applications. In this work, we have substituted the trivalent cation Gd3+ in LiGd(WO4)2 by ions: lutetium(Lu3+),and co-doped by erbium (Er3+) and Ytterbium (Yb3+), In this work Er3+ / Yb3+ co-doped LiGd1- xLux(WO4)2 with different concentrations (x% = 2.5%.5%.80%.90%.95%) were prepared by solid State method, calcined at T=730°C during 15h for (x% = 2.5%.5%.80%), and for (x% = 90%.95%) calcined at T=800°C during 72 hours. Under the excitation at 380 nm and 980 nm producing a bright green upconversion emission at 530,552 nm and down conversion at 530 nm and 552 were detected in LiGdxLu1-x(WO4) 2 codoped 0.4% Er3+ 1% Yb3+ x% = 2.5%,5%,80%,90%,95%). In this study, the up conversion properties of LiGd (WO4)2:Er3+/Yb3+ phosphors modified byLu3+doping were studied. The luminescence spectrum, luminescence lifetime was analyzed, and the influence of Lu3+ on the luminescence properties was investigated. This work provides theoretical and data support for the development of up-conversion and down-conversion materials.
Keywords	co-doped, up-conversion, tungstates, rare-earth ions.

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Title	Influence of Zr content on the morphology and mechanical properties of chromium nitrides coatings
Abstract	In this study, binary (CrN, ZrN) and ternary (CrZr-N) films were synthesized by co-sputtering chromium and zirconium using an RF reactive magnetron. As a function of Zr concentration, the crystalline structures, morphological, mechanical, and tribological properties of films were characterized. X-ray diffraction reveals that the Cr-Zr-N films have a two-phase microstructure consisting of a cubic CrN phase and a hexagonal Cr2N phase. According to the results, the mechanical and tribological properties of films depend significantly on the Zr content. As the concentration of Zr increases, a dense, compact structure with a rough surface develops. In addition, the mechanical properties, including hardness (the maximum hardness is 26,3 GPa), are significantly enhanced compared to CrN and ZrN films, particularly at 42 at.% Zr. In the scratch test, the adhesion of the hardest film (Cr0.11Zr0.42N0.47) fails at Lc2=25N.
Keywords	CrN, ZrN, Cr-Zr-N, Hardness, Wear property

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Title	X-ray characterization of Cr-N hard coating
Abstract	Chromium nitrides thin films are widely used owing to their exceptional thermal and mechanical properties. In this work we investigated the interaction between thin films of chromium deposited on XC100 carbon-based steel substrates (containing 1% mass of C) by magnetron sputtering under varied nitrogen percentage in the plasma (N2+Ar). The produced samples were analyzed by X-ray diffraction, X-ray microanalysis (EDS, WDS) and X-ray photon spectroscopy (XPS). Cr-N system characterization showed that the chromium nitride Cr2N of the hexagonal structure obtained at 10% of nitrogen in the plasma, with stresses of -2 GPa and a ratio N/Cr close to 0.5. The morphology of the Cr2N presented a dense columnar structure contaminated with oxides, resulted in roughness values of 74.5 nm. The chromium nitride CrN of the cubic phase structure obtained for 20% nitrogen in the plasma, with stresses on the order of -1.8 GPa. The morphology of this phase presented a dense, homogeneous structure with a low roughness of 8.5 nm
Keywords	Chromium nitride, XRD, XPS, WDS, mechanical properties

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Title	Degradation of the mechanical behavior of polyethylene PEDH80 by artificial aging under the effects of ultraviolet radiation and tensile testing.
Abstract	The Polyethylene (PE) is a more modern polymer material, its use for transporting liquids is now widespread all over the world, and its physical, chemical and mechanical properties have made it a preferred material for gas supply and distribution networks. Polymer tubes are subject to unexpected and sometimes catastrophic ruptures in their fields of application, hence the importance of knowing their mechanical properties through the correct size of tubes. The topic focuses on the characterization of high-density polyethylene HDPE 80 on the micro structural scale during mechanical stresses after aging. The aim of this work is to contribute to a better understanding of the mechanisms that make it possible to diagnose the degradation state of HDPE80 pipe layers subjected to accelerated aging under a UV lamp. Tensile tests performed on old PEHD80 polyethylene showed that the deformation varies with irradiation duration and layer. The results showed that an increase in the irradiation duration leads to a decrease in elongation. From the old samples, we were initially interested in the effect of UV radiation, which is one of the main factors in the degradation of HDPE80.
Keywords	Polymer; HDPE80; Artificial ageing; ultraviolet Radiation; Tensile.

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Title	Primary Reagent Nature Effect on Bi-2212 Superconducting Phase Precursor Formation Using Photo-polymerization Based Method
Abstract	Two precursors powder of the Bi-2212 Superconducting phase were prepared using photo-polymerization reaction based method (PPR) as an alternative chemical method coupled with the conventional solid-state reaction (SSR) and with two different nature of starting reagent (nitrates and oxides). Precursors powder were characterized using X-ray diffraction (XRD), Infrared Spectroscopy (FTIR) and Scanning electron microscopy (SEM) coupled with Energy Dispersive X (EDX). The XRD results revealed that both cases revealed the Bi-2212 phase formation after the first calcination step with the presence of the Bi-2201 phase. The oxides precursor powder was purer than the nitrates one. SEM micrograph showed spherical grains shape, with an average grain size of 0.5 to 2 µm. The EDX measurements confirmed the dominance of the chemical elements which form the Bi-2212 phase.
Keywords	Photo-polymerization, Bi-2212, Superconductors, X-ray diffraction, HTSC.

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Title	Structural and Optical properties of LiGd1-xLux(WO4)2 co-doped Yb3+/Er3+
Abstract	Tungstate crystals with the general formula A(RE)(WO4)2, where A is the alkaline element; K, Li, Na, Cs and Rb; the (RE) is trivalent element such rares earth have attracted a great attention, for their great optical properties and high performance for many applications. In this work, we have substituted the trivalent cation Gd3+ in LiGd(WO4)2 by ions: lutetium(Lu3+),and co-doped by erbium (Er3+) and Ytterbium (Yb3+), In this work Er3+ / Yb3+ co-doped LiGd1-xLux(WO4)2 with different concentrations (x% =2.5%.5%.80%.90%.95%) were prepared by solid State method, calcined at T=730°C during 15h for (x% =2.5%%.80%), and for (x% = 90%.95%) calcined atT=800°C during 72 hours. Under the excitation at 380 nm and 980 nm producing a bright green upconversion emission at 530,552 nm and down conversion at 530 nm and 552 were detected in LiGdxLu1-x(WO4) 2 codoped 0.4% Er3+ 1% Yb3+x% = 2.5%,5%,80%,90%,95%). In this study, the up conversion properties of LiGd (WO4)2:Er3+/Yb3+ phosphors modified byLu3+doping were studied. The luminescence spectrum, luminescence lifetime was analyzed, and the influence of Lu3+ on the luminescence properties was investigated. This work provides theoretical and data support for the development of up-conversion and down-conversion materials.
Keywords	co-doped, up-conversion, tungstates,rare-earth ions

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Title	Influence of precursors on ZnO films structural, microstructural, optical properties and copper ions removal
Abstract	ZnO films were prepared by spray pyrolysis technique using zinc acetate (ZAC-0.2), zinc chloride (ZCL-0.2), and dehydrated zinc nitrate (ZNH-0.2) precursors. The structure, microstructure, and optical properties of these materials are studied as well as the efficiency to adsorb copper ions. From the obtained results, all ZnO films belong to hexagonal Wurtzite structure and the ZAC-0.2 sample showed the highest transparency between 400-800 nm wavelengths, the highest Urbach energy (Eurb) of 84.85 meV, and the highest efficiency to remove 52 % of copper ions in aqueous solution.
Keywords	ZnO Thin Films Precursor Ion XRD Study FTIR UV-Vis Adsorption

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Title	Study of structural, optical, and spectroscopic properties of Eu3+ doped (Gd2O3/Lu2O3)- Al2O3 systems, synthesized by solid state reaction
Abstract	Europium doped (Gd1-xLux)3Al5O12 Garnet compositions are of great interest in terms of structural and optical properties; the presence of Gd3+ in these compounds provides advantages over the photoluminescence of the activator's ions (Eu3+) due to Gd's low electronegativity. The disadvantage of garnet containing Gd is that it is not formed by this ion alone because its large size prevents the formation of the pure phase, so it requires compensation with other ions such as Lutetium in order to stabilize GAG. We attempted to develop and elaborate the type (Gd1-xLux)3Al5O12 doped 5 at% Eu3+ compounds prepared by the solid-state reaction method, calcined at T=1450°C. XRD analyses have shown the presence of intermediate phases such as: Ln2O3, Ln4Al2O9, LnAlO3, and Ln3Al5O12. FTIR analyses have identified the different active internal vibration modes corresponding to the specific absorption bands of M-O (M: Gd and Lu or Al elements) associated at different frequencies of these compounds. Based on photoluminescence results, Eu3+ is also an attractive ion in terms of structural symmetry in the host materials luminescent corresponding to the 5D0-7FJ (J=1,2) emission transitions under 360 nm wavelength excitation.
Keywords	Europium; Solid State Reaction Method; XRD; FTIR; Photoluminescence

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Title	Investigation of a fast optical half-adder combining nonlinear 2D-PC ring resonator and interference beams
Abstract	In this paper, investigation and optimization of optical half adder function using nonlinear photonic ring resonator is designed. The photonic crystal of this design has a lattice constant of 590 nm and a footprint of the proposed structure is 334.17 µm2. In this design, by using the interferences based defect and the non-linear Kerr effect, as well as the control of transmission power of the logic function, including the radius and refractive index of the coupling rods. Therefore, the central waveguides generate at 1.5503 µm appropriate to the conventional C-Band. In this proposed design, the profiles simulation of the electric field distribution and photonic band gap analysis have been done using the FDTD and PWE method, respectively. As a result, the structure contrast ratio is estimated between 12.74 and 16.33dB, proportional to the output power, which varies between 1.7% to 5% and 88 % to 108% for logic level "0" and "1" respectively. Resulting a minimum threshold power around of 0.3 W/µm2.
Keywords	nonlinear photonics crystals (NLPC), interference beams, ring resonators, Kerr effect, FDTD method

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Title	Modeling of a distributed fiber optic sensor based on Phase-OTDR for dynamic monitoring applications
Abstract	In this work, we present the modeling and simulation results of a Distributed Fiber Optic Sensor (DFOS) based on Phase-OTDR technique (Optical Time Domain Reflectometry) with direct detection scheme. The developed simulation model exploits the Rayleigh backscattered signal (RBS) in optical fibers, which is considered as discrete reflectors distributed along the fiber length. The model allows studying the vibration event detection, location and tracking for dynamic monitoring applications.
Keywords	Distributed fiber sensor Rayleigh backscattering phase-OTDR

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Title	Diffraction of vector vortex beams by a circular aperture
Abstract	Laser Vector Beams are beams whose transverse section exhibits a spatially varying state of polarization. A special case of such beams is the Cylindrical Vector Beams which have a cylindrical symmetry around the optical axis. The most famous practical example is the Vector Vortex Laguerre Gaussian beams, which are widely used in optical communication, super-resolution microscopy, and laser micromachining. In this communication, we demonstrate and simulate the diffraction and focusing of such beam as a function of different parameters related to the Vector beam. Based on the extended vectorial Rayleigh-Sommerfeld diffraction integral, we demonstrate the analytical expressions of the electric field components, of the diffraction by a circular aperture of some Vector Vortex Laguerre Gaussian beams with different topological charges.
Keywords	optical waveguides, vector vortex beam, propagation, circular aperture, diffraction

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Title	Comparative study of violet and green InGaN-based SQW LEDs using Silvaco TCAD tool
Abstract	In this paper, comparative study between violet and green SQW LEDs has been numerically achieved, using Silvaco TCAd simulator, in this work GaN, InGaN, and AlGaN materials are used. The studied structures are needed when designing broad spectrum of visible light emissions and white light LEDs, especially for phosphor free solid-state lighting technology and visible light communication (VLC).
Keywords	GaN, InGaN, AlGaN,Silvaco, single quantum well(SQW).

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Title	Angular acceleration of twisted beams
Abstract	To control the angular acceleration of light laser beam, we propose a novel method based on the Laguerre-Gaussian vortex modes. These modes of LG are an example of twisted beams carrying orbital angular momentum; we make a superposition between two Laguerre-Gaussian vortices with opposite helicity and different Rayleigh lengths. We simulate the dynamics of the superposition beam in different plane z under Mathematica 11 environment.
Keywords	Twisted light, Angular acceleration, Laser beam, Laguerre-Gaussian beam, Optical vortices

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Title	Determining the Density and Temperature of a Gas Mapping Profile Using Measurement Optical Interferometry. Application He-Ne Laser
Abstract	This work presents an optical diagnosis using interferometer method (Fig.1) using laser He-Ne. The density and the temperature are visualized by studying the interferograms of Helium gas medium subjected to a stationary DC (Corona Discharge) at atmospheric pressure. The density is extracted from the phase shifting introduced by the studied medium, and the temperature is deduced from the ideal gas law. The refractive index is related to the density through the Gladstone–Dale equation. The experimental set up that we have applied here is assumed to be cylindrically symmetric and the distance between electrodes, equals 10 mm. The obtained results show that the rate variation of the density increase from 10 to 45% and the temperature is varying between 300 to 500 K in all the space.
Keywords	Abel inversion, Mach-Zehnder interferometer, refractive index, He-Ne Laser.

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Title	Modeling Study of Different Photonic Crystal Fiber for Sensors
Abstract	Optical fibers have been widely applied to telecommunication, imaging, lasers, and sensing. Among the different types of fibers, photonic crystal fibers (PCFs), also called microstructured optical fibers, characterized by air holes arranged along the length of fibers have experienced tremendous advance due to their unique advantages. In this work, we present the existing results for applying the PCF as a sensors application, where we have chosen a modern collection of manuscripts previously published in scientific journals and we compared their presented results to demonstrate best results previously published in the use PCF for different sensors.
Keywords	Sensors microstructured optical fibers Refractive Index Sensors PCF

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Title	Strengthening the irrigation need through the reuse of treated wastewater in agriculture. Perspectives in erecting solar still system in M'Zab valley
Abstract	In Algerian high-lands and Sahara, aquifer is considered as a much more reliable and sustainable water sources for irrigation and human need. Recently, the groundwater table is still declining, due to the extreme weather events and the over exploitation. Within this frame, M'Zab valley, in (Ghardaia) has known a serious imbalance in water supply, due to the drop and contamination of water tables. Accordingly, a swift plan is very required to satisfy the excessive demand on water. Through this attempt, the perspective to strength the irrigation need through the reuse of the treated waste water from Al-Attef wastewater treatment plant, has been highlighted. The suggestion includes the possibility of recovering the treated waste water, which is rejected in the valley at the level of the final process stage. The process consists of studying the theoretical basis for designing a solar still system at the Waste Water Treatment Plant 'WWTP' final output. The aim is to recupe about 25000 m3/day of the treated waste water, after passing it through a second solar distillation treatment process where, it is heated then evaporates. The final obtained water from the cooler tanks of the solar plant can be kept, whereas the impurities remain in the inner trough. The purified water is then moved into the distillation channel from which it is collected in the storage tank, to be used later in irrigation.
Keywords	aquifer, irrigation, over-exploitation, reusing, Waste water treatment, solar still system

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Title	A Model Predictive Current Controller For Quasi Z-source Inverter
Abstract	The aim of this paper is to study the model predictive control (MPC) for the quasi-Z-source inverter (qZSI). The MPC algorithm can adjust the dc-dc and the dc-ac side of the quasi z- source inverter by minimizing a cost function and choosing the optimal vector and calculate its duration. This reduces the cumbersome of the system and reduces the number of calculation. A simulation using MATLAB/SIMULINK software has been performed with a hardware implementation using a dSPACE DS1104 board to evaluate the model predictive control for the qZSI prototype.
Keywords	Quasi z-source, inverter, model predictive control.

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Title	An Improved Drooping Control for Distributed Generation Inverters in an Islanded AC Microgrid
Abstract	With the advancement in technology, there is an immense increase in the demand for electrical energy that has not only become a challenge for its production but also its distribution. In the last few years, many countries have shown a huge interest in Micro-Grid (MG) integrating renewable energy. But the fluctuation and the variation of resources make the challenge bigger in designing and controlling these (MG), especially in islanding mode. Droop-controlled microgrids have attracted numerous modeling approaches with a view to improving their operation and applicability. In this paper, we propose a decentralized controller strategy for power sharing in a typical MG consisting of two DGs, which are considered Voltage Source Inverters (VSIs) interfaced. So, in this decentralized controller strategy, there are two control methods based on droop control; f-P/Q-V droop control and P-f/V-Q droop control. Numerical simulations have been presented to validate the performance of the proposed power sharing decentralized controller.
Keywords	Microgrid, Distributed Generation, Droop Control, Active and Reactive Power, Voltage Inverters.

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Title	Backstepping and Modified Backstepping Control for Doubly Fed Induction Motor
Abstract	Abstract—This paper proposed a comparative study between backstepping control and modified backstepping control for a doubly fed induction motor (DFIM). First of all, the mathematical model of the DFIM is presented. Secondly, the backstepping control techniques are described and designed. These control techniques are synthesized based on Lyapunov theory. thertly the modified backstepping control techniques are fabricated based on with the addition of a PI regulator in backstepping control .The performance of the two control methods of backstepping are compared in terms of response time, overshoot, static and dynamic error, and robustness. Simulation results of the two backstepping controls are obtained using Matlab/Simulink environment. The results show clearly that the modified backstepping control provides improved performance than the classical one.
Keywords	Keywords— Doubly Fed Induction Machine; Backstepping Control; Inverter voltage; pulse width modulation

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Title	Direct Active and Reactive Power Control of Wind Energy Conversion System based DFIG passing through different operation modes
Abstract	In the presented paper, a Direct Power Control (DPC) has been applied to control the Double Fed Induction Generator (DFIG) of the Wind Energy Conversion System (WECS). The proposed methodology is based on the direct control of the active and reactive power, where both powers are estimated using currents and voltages and compared to their reference values using hysteresis comparators. Then the obtained errors are converted into digital values. By using the rotor flux angle, its sector number is estimated and then all values are used in the commutation table in order to determine the appropriate rotor voltage vector to be applied to the inverter. The objective of this study is to apply the DPC method to the WT-DFIG system and test this control method by passing through all three operating modes (sub-synchronous, synchronous, and super-synchronous) that can drive the WEC system. The Maximum Power Point Tracking (MPPT) algorithm is used to extract the maximum wind power. The studied system and the proposed control have been tested under MATLAB/Simulink environment and the obtained results have shown the effectiveness of the proposed control under the three modes with good power quality.
Keywords	Wind Energy Conversion System; Direct Power Control; Doubly Fed Induction Generator; MPPT.

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Title	Solar photovoltaic power prediction using artificial neural networks
Abstract	Energy is currently a critical and important sector, that's why science and engineering are interested in it, specifically renewable energies. Photovoltaic modules are one of the most promising technologies for directly generating electricity from a renewable source. Nevertheless, several environmental and unpredictable parameters may affect their performance, which introduces difficulties forecasting their output. In this paper, the attention is to forecast the power output of a PV module using ANNs, which have the ability to tackle nonlinear problems. The study accounts for different environmental factors, namely, ambient temperature, solar irradiation, wind speed, and module temperature, while the output is power generation of the PV module. The used data was collected on 3 different days. First the ANN model is trained, validated, and tested with the first dataset; then a new dataset is introduced to the model to predict the output; and finally, based on the model prediction, a correlation for the power output is produced and evaluated with different datasets. Furthermore, the performance of different training algorithm is evaluated in this work, the results shows that a high level of accuracy is achieved using ANNs in the prediction process, where the Scaled Conjugate Gradient was the best in terms of performance with a correlation coefficient of 0.99 and low error values, 3.46 (RMSE) and 2.75 (MAE). A great level of precision is obtained with developed correlation as well (0.95 (R^2) and 5.20 (RMSE)).
Keywords	Photovoltaic, ANN, Power output, prediction, PV module

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Title	Thermal performance evaluation of spiral earth–air heat exchanger for summer cooling
Abstract	In the summer, earth-air heat exchanger (EAHE) systems can be utilized to lower the cooling demand of buildings. To predict the thermal performance the proposed spiral earth-air heat exchanger (SEAHE) system, a transient model based on computational fluid dynamics was created. The model was created using the FLUENT simulation software. The proposed spiral earth-air heat exchanger (SEAHE) system consists of steel tube with a diameter of 0.03 m has been arranged as a vertical spiral layout with 3 m length and 0.6 m diameter and 0.22 m pitch size. The resulting model is tested against experimental studies using an experimental setup in El Oued (Southern Algeria). thermal performance of the spiral earth–air heat exchanger system is studied. By operating the system for 24 hours at a flow velocity of 13 m/s, the SEAHE discussed in this research paper gives outlet air temperature in the range of 24.8 to 26.9 °C and cooling capacity of 228.7 to 205.3 W and Efficacy of 0.99 to 0.89. Furthermore, investigations indicate that the thermal performance of the spiral earth-air heat exchanger (SEAHE) system is greatly affected by the operation time
Keywords	SEAHE system; Efficacy; Cooling; heat exchanger; hot climate

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Title	Performance Evaluation of Modulated Model Predictive Control for a Three-Phase two level Inverter
Abstract	This paper aims to investigate the performance of modulated model predictive control (M2PC) compared with the classical predictive control (MPC), for a two-level three-phase voltage source inverter connected to a linear load (RL). The classical MPC operates in different switching frequencies, which leads to increasing the THD due to the noise and current ripple, therefore it is harder to design the filter system. The proposed controller is designed by combining the classical MPC with the space vector modulation (SVM) pattern to enhance the steady-state performance and achieve the constant switching frequency. The simulation and experimental results illustrated that the fixed switching frequency reduced THD in current and enhance the output power quality, and increase the dynamic response compared to the conventional MPC scheme. In contrast to the classical MPC, the implementation of the M2PC requires a large amount of computation for switching frequency.
Keywords	Model predictive control (MPC), three-phase inverters, modulated model predictive control(M2PC), fixed switching frequency.

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Title	MPPT Design Using Cuckoo Search Algorithm Technique for Photovoltaic System under Partial Shading Conditions
Abstract	A photovoltaic (PV) module has a voltage and current characteristic that vary depending on the conditions of the environment. When the current and voltage reach their optimal point, the power produced by the system is maximum. However, this power can fluctuate due to various factors such as temperature, irradiance and charge. To achieve the maximum power, a maximum power point tracking method is required. The maximum power point of a PV array was calculated using the cuckoo search (CS) algorithm technique. However, it is still unclear how it tracks the maximum power point of a shaded PV module. As a result, the focus of this research is on using the CSA method to track a PV module's maximum power under partial shadowing. Using Matlab/Simulink, the shaded PV module is simulated. Its performance is also compared to the perturb and observe (P&O) and incremental conductance (IC) algorithms. The results reveal that the CS algorithm's accuracy best performance. The both of P&O and IC methods are not preferred for tracking the maximum power point of a shaded PV module.
Keywords	PV system, P&O, CSA, IC, DC-DC Boost converter and partial shading condition (PSC).

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Title	An Improved Adaptive Deadbeat Control Using Online Model Parameter Identification for Grid-Connected Two-Level Inverter
Abstract	This work proposes an adaptive deadbeat control scheme with online parameters identification for a three-phase grid-connected two-level inverter to mitigate the parameter mismatch and uncertainties in the resistor-inductor (R-L) filter. The parameter mismatch effect is studied, and the formula of the prediction error of grid current in the d-q reference frame is established. The filter parameters are estimated using the recursive least square parameters estimation method. Then, the deadbeat controller uses the estimated parameters to accurately calculate the optimal reference voltage vectors generated by the two-level inverter using the space vector modulation (SVM) technique. The deadbeat controller is implemented in a rotary reference frame following the voltage-oriented control (VOC) principle. This improves the tracking performance of the current injected to the grid under uncertainties and mismatches in the filter parameters. As a result, the inherent sensibility of the deadbeat controller to the parameters mismatch is avoided. Simulation results show the performance improvement of the proposed scheme compared with the conventional deadbeat controller in terms of tracking accuracy and current waveform quality by using the root mean square (RMS) of the current tracking error and the total harmonic distortion (THD), respectively.
Keywords	Deadbeat current controller; grid-connected inverter; online identification; recursive least square estimator; space vector modulation.

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Title	A Robust Droop Control Technique for Parallel Inverters in Micro Grid Applications
Abstract	in last years, several countries have shown massive interest in Micro Grid technology, In order to meet the demand for electricity due to the development of the population by integrating renewable energy and reducing the greenhouse gas emission. When we integrate renewable energies into smart grids, the idea of a micro grid (MG) becomes real, The micro-grid is a sophisticated, intellectual, local and small network that can be separated from the central network and operates autonomously but the integration of distributed renewable energy generations is expecting frequency and voltage droop due to increasing demand of PV and load. To permit zero net-energy consumption and best power management for future smart city or buildings, this paper discusses the (DC) voltage and frequency regulation approach to address the rise/drop of voltage in a Microgrid, equipped with a residential Photovoltaic (PV) system, storage battery (SB), residential load and Smart Control Strategies (SCS) of parallel operated voltage source inverter (VSI). Voltage and frequency can be regulated by controlling the active and reative power. The effectiveness of the proposed Droop Controller is verified by numerical simulation. A Simulation result of (MG) is given to demonstrate the effectiveness of the proposed approach.
Keywords	Droop control, micro grid, hierarchical control, photovoltaic system, voltage source inverter (VSI)

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Title	Design and feasibility of a photovoltaic/wind turbine/battery system in Béjaïa area
Abstract	In this paper, design and feasibility of a photovoltaic/wind turbine/batteries hybrid system is presented. The main components of the studied system are solar arrays, wind turbine and batteries connected through a DC bus to supply a load . The application is made in the area of Bejaia (Algeria), a Mediterranean region where the solar and wind energy are extremely exploitable in this region due to its geographical location. Due to the instantaneous changing of solar irradiance, temperature and wind speeds, maximum power point tracking (MPPT) is integrated. The Homer software is used to evaluate the studied system and demonstrate the best feasible integration of the several sources at the Bejaia location. Economic factors such as system lifetime, fixed expenses, and maintenance costs are all considered. The findings of the suggested study under various solar irradiation and wind speed profiles are presented to demonstrate its applicability and improvements.
Keywords	Photovoltaic, wind turbine, optimization, sizing

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Title	Thermal Loads Evaluation of Cold Storage Container for Vegetables in Rural Saharan Environment
Abstract	Improving agricultural production enhances food security, the economy, and rural life across many developing countries. Because of insufficient post-harvest storage and transportation options, food is wasted on farms. Vegetables have a short shelf life due to their high moisture content, making them unsuitable for growing in remote areas. Discover how much cooling is required to be circulated via a cold storage unit in a potentially dangerous environment such as Adrar Province, where certain criteria take priority and a cheap average can affect the decisions that are made regarding technological options. This evaluation of the refrigerated balance sheet will focus on the thermal loads that come from living in a desert. So, high temperatures and a huge amount of solar radiation can make the rate of cooling go up. Enhanced thermal insulation necessitates the investment in cold storage infrastructure, which is costly and dependent on technological progress.
Keywords	Cold Storage, Thermal Loads, Insulation Material, Cooling Capacity, Saharan Environment.

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Title	Effet inclinition for PV System and data acquisition used CPU in experimental validation
Abstract	A data logger system has been installed for the two solar panels at a different angle of inclination. So that the current and tension of the solar panels as well as the radiation reflected on the solar panels and the temperature of the two solar panels are extracted. The data logger system consists of an Arduino microcontroller coil equipped with a current sensor, a current and tension sensor, and Memory Card. The acquired data is stored on the SD card every 20 minutes, in the form of a .txt file. The data is acquired using a real-time acquisition system. The test results show that obtaining data on the characteristics of the solar panels using a data logger file was able to store and display a large number of solar panels data that at a tilt angle of 35 degrees it performed higher than 32 degrees in April in the Ouargla region of Algeria.
Keywords	ARDUINO Mega , Solar panel, Voltage sensor, Current sensor, Pyranometer, SD carte

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Title	Comparative study of Nd: YAG solar laser performance in end-pumping, side-pumping and end-side-end-pumping configurations
Abstract	Solar-pumped solid-state lasers are promising for numerous space and terrestrial applications. Several pumping structures for solar pumped laser systems have been proposed to improve their performance. Where these laser systems have several configurations including side pumping, end pumping and end-side-end pumping. This paper reviews a comparative study between the performances of Nd: YAG solar lasers by using these pumping techniques. Although the most efficient solar-laser systems have end-pumping approaches, the thermal loading effects caused by nonuniform distribution of absorbed pump light in these pumping configurations negatively affect their efficiencies. The side-pumping configuration can present higher laser beam quality as it allows uniform absorption distribution along the laser rod axis and spreads the absorbed power within the laser medium, reducing the associated thermal loading problems. While the end-side-end pumping approach provides an effective solution to reach double laser power, and allows to achieve a uniform distribution of pumping energy along the effective medium.
Keywords	Solar pumped laser, end pumping, side pumping, end side end pumping, collection efficiency.

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Title	Bearing Fault Diagnosis by Using Convolutional Neural Network and Information Fusion on Induction Motor
Abstract	Along with the growth of big data in the industry, the integration of the data-driven analysis method to assist intelligent fault diagnosis has emerged as a new trend. A promising artificial intelligence technique called deep learning has just been developed. It can automatically extract features from raw data, providing a novel method to reduce expert bias and reveal underlying relationships hidden in the data. Deep learning methods that encourage learning include Convolutional Neural Networks (CNN). This study proposes a novel CNN-based intelligent fault diagnosis approach. To deal with raw signal data simply, an examination of an information fusion transformation from signals to images comes first. CNN then practices on these pictures. The studied method is examined using the motor bearing dataset from Case Western Reserve University. According to the results, the suggested strategy has a prediction accuracy of up to 99.21%.
Keywords	Fault diagnosis Convolutional Neural Network Data-Driven method Information Fusion

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Title	Comparative Analysis and Optimization of MPPT Algorithms using Classical and Machine Learning Methods Applied to a Standalone Photovoltaic Plant
Abstract	In recent years, various control methods for MPPT of PV systems have been proposed. In the research literature, different MPPT methods for PV systems have been evaluated in terms of energy efficiency, power conversion, dynamic performance and reliability under different environmental conditions. Among the different MPPT methods, Artificial Intelligence (AI) MPPT is one of the best methods due to its ability to reject noise and not needing prior information about physical parameters. In this paper, a comparison between MPPT algorithms for classical and Machine Learning (ML) methods has been presented, the PV system studied supplies an off-grid (DC load). MATLAB/Simulink is used for simulation tests to confirm the performance of the ML-MPPT methods. The results of the simulation tests validate the improved performance of the recommended ML-MPPT method (Artificial Neural Network (ANN)) compared to the classical method.
Keywords	MPPT, PV Plant, Machine Learning, Artificial Neural Network, Incremental Conductance, Simulink

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Title	Eliminate of Torque Ripple using Fuzzy Logic Backstepping Control of an Induction Motor
Abstract	The major objective of this paper is to ameliorate the performance and effectiveness of an induction motor (IM) using fuzzy logic-based backstepping control. Torque ripple is a problem that is typically related to the classical backstepping technique. Artificial intelligence based on a backstepping strategy is proposed as a solution to this problem, which uses of fuzzy logic control technique. Simulation results, using MATLAB/Simulink, show improved performance in terms of reduced torque ripple with a lower Total Harmonic Distortion (THD) of the stator current compared to the classical backstepping control.
Keywords	Induction motor, Backstepping control, fuzzy - Backstepping control, torque ripple, total harmonic distortion

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Title	Comparative study of solar lasers performance with Nd:YAG and Nd:Glasses active mediums
Abstract	During the last decades, solar laser began to be of much interest because of their numerous applications whether the terrestrial ones or their potential space-based technologies. solids were among the first investigated materials in order to select suitable solar medium, rare earth ions in crystal and glass hosts represent the very intensively used candidate in the optimization of lasing characteristics, neodymium ion in the trivalent form gives the desired characteristics better than any other ion, The difference in optical, thermal , structural properties between Glass and YAG ($Y_3Al_5O_{12}$) lead to many differences in the different properties of the emitted solar laser : laser gain, threshold and pulses rates. From available data, this work involves a comparative study between the several properties of the different Glasses and YAG crystal doped with neodymium ions in solar pumped lasers.
Keywords	laser, solar laser, neodymium, Nd:YAG, Glass, solar pumped lasers.

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Title	Experimental study of Biodiesel extraction from the Algerian desert plants: A Case of Castor Bean
Abstract	The current work focuses on the biodiesel production from castor seeds of El Oued regions (Algeria), then use it as fuel to replace the petro-fuel. In this line, we based on some criteria to select this plant as source to produce the biodiesel such as: the castor trees are widely found in the Algerian desert, and the castor is considered as oleaginous plant with high oil content. Therefore, we extracted the castor oil from the castor seeds by grinding and pressing, then the biodiesel was produced from the extracted oil via transesterification. We note that our products proprieties are in the same line as those mentioned in the literature. Consequently, the validation is based on comparing some physical and chemical parameters (viscosity, density, cetane number, flash point). Finally, the Algerian seed kernel castor may be considered as conventional feedstock for oil and biodiesel production, considering the obtained parameters in this work.
Keywords	Biodiesel Castor seeds Castor oil Transesterification Plants of Algerian desert

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Title	Optimal Placement of PMUs for Power System Using Gazelle Optimizer Algorithm
Abstract	The Phasor Measurement Units (PMUs) is a state-of-the-art measuring device that is installed in the electrical power system to enable its monitoring and control. In fact, PMUs are the most accurate and advanced time-synchronized technology meters that provide real-time voltage measurements for the current phases of the buses in which these devices are placed. But ,the number of PMUs and their placements must be adapted to the technical and economic requirements. This paper , explores the new Gazelle Optimizer (GOA) algorithm to solve the problem of optimal placement of PMUs, taking into account the main goal of ensuring real-time observability of the electrical system. The optimal placement problem of PMUs is formulated in such a way that the number of installed PMUs is minimized. For the validation of the proposed application of the GOA algorithm to ensure the optimal placement of PMUs, three tests were performed in this paper, two tests on the IEEE-14 bus and 24 buses and 30 buses,The simulation results of the application of the GOA algorithm show that the optimal PMUs placements can ensure the high observability of the three tested power grid systems states. This paper is organized as follows: section II deals with problem statement and formulations, section III optimal PMU placement formulation and observability in power system, section IV describes in detail the principle and the formulation of the Gazelle Optimizer (GOA), section V presents the simulation results of the three power system studied cases. The last section presents the conclusion.
Keywords	Optimal PMUs Pacement(OPP). Phasor Measurement Units(PMUs). System Of Redundancy Index (SORI). Gazelle Optimizer Algorithm (GOA).

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Title	A Comparative Study Between three Different MPPT Algorithms for Photovoltaic System
Abstract	maximum power point tracking (MPPT) algorithm lead an important role in optimization the performance of a photovoltaic (PV) generation systems. To validate the correctness and performance of the MPPT techniques, We have created an fuzzy logic (FLC) controller for the maximum power point tracking (MPPT) of a photovoltaic system and compared it to conventional tracking algorithms Perturb and Observe (P&O) and incremental conductance (INC). The proposed system was simulated and tested successfully by using MATLAB Simulink on a photovoltaic solar panel model. It is demonstrated that the fuzzy logic based MPPT tracking require less time and provide more accurate results under rapidly changing atmospheric conditions. compared to conventional tracking algorithms Perturb and Observe (P&O) and incremental conductance (INC).
Keywords	Photovoltaic (PV), MPP, Perturb and observe, Simulink, MPPT, Perturb and Observe (P&O), incremental conductance (INC), fuzzy logic, controller, boost converter.

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Title	Circulating Current Elimination for Double-stage Grid-Connected Modular Multilevel Converter in PV Applications
Abstract	In this paper, an enhanced circulating current controller for grid-connected single-phase modular multilevel converter photovoltaic systems was proposed. Two conversion stages are employed in this photovoltaic system: a boost converter for tracking the maximum power point and a modular multilevel converter that serves as an interface. A Perturb &Observe controller produces the best power point tracking results, and in order to operate at unity power factor, the modular multilevel converter adjusts the DC link voltage and synchronizes the grid voltage and current. The modular multilevel converter is made up of a number of similar sub-modules, and the interplay between switching operations and Pr.Rezaoui Mehamed Mounir LAADI Laboratory,Faculty of Science and Technology University of Djelfa 17000 DZ,Djelfa,Algeria mm_rezaoui@yahoo.fr the DC/DC converter is optional. The Maximum Power Point Tracking (MPPT) is carried out by the DC-DC converter for double stage configuration[2-5-11]. The modular multilevel converter (MMC), first reported by Prof. R. Marquardt in 2001[14]. the sub-modules fluctuating capacitor voltages causes second and other even-order harmonics to appear in the circulating currents. Suppressing this second harmonic is preferred. This second harmonic can be suppressed using a standard PI controller in the control system of a three phase modular multilevel converter with synchronous frame. A proportional resonant controller is an alternative. MATLAB/Simulation uses the suggested systems validity to validate it.
Keywords	Modular Multilevel Converter, Circulating Current, Grid, photovoltaic (PV) array

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Title	A Review of Solar Photovoltaïque Potential in Algeria
Abstract	The Algerian economy is heavily based on the fossil fuels sector where 93.6% of its exportations are predominantly oil and natural gas. During the previous decade, the market price of crude oil has fallen down dramatically and up to this day, its price is continually shifting which has badly damaged the national economy. Consequently, the move to renewable energy extraction and technical development became a major objective for the Algerian government. Algeria is planning to move to the era of a green economy which is a unique strategy to fill future energy needs and reduce environmentrelated worries simultaneously. The Algerian territory is characterized by substantial renewable energy resources such as solar, wind, hydro, biomass, and geothermal energy. In this work, a short energy profile and renewable energy potential have been analysed. This study primarily focuses on, from year to year, by showing the necessity for the rise of solar photovoltaics throughout the globe and their ambitions, first, in the Arab world secondly, in the Maghreb, and finally, Algeria's presentation as a problematic example. In two cases: Peak consumption and how to solve it and the percentage Development of Solar photovoltaic (PV) With describing one of the solar power plants in detail. Without forgetting its role in the relationship between supply and demand.
Keywords	Solar Photovoltaïc, Algeria, energy production, consumption.

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Title	Direct Torque Control of Doubly-Fed Induction Generator for Wind turbine generation
Abstract	this paper presents the design and analysis of a direct torque control of a doubly-fed induction generator (DFIG) applied in wind energy systems. As the penetration of renewable energy sources is increasing abundantly, the advantages of this control are minimal torque response time, the absence of controllers such as PI controllers for torque and flux, and when taking into account the randomness of wind speed. The maximum power at the wind turbine is optimized using the TSR (Tip Speed Ratio) algorithm, and excellent simulation results for DTC have been obtained in the MATLAB_SIMULINK platform.
Keywords	Wind energy, Direct Torque Control (DTC), doubly fed induction generator "DFIG", MPPT.

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Title	Mathematical modeling and analysis of a solar still with multiple-effect cover cooling
Abstract	This paper presents a theoretical study of the thermal performance of a double-sloped basin still coupling with multiple-effect cover cooling. The still was built so that one of its cover sides (the multiple-stage) is tilted to be parallel to sun rays and, therefore, be in the shaded area. Direct solar radiation heated the saline water and evaporated it. A fraction of the resulting vapor condensed on the inner glass cover surface while the rest was condenser to the outer first partition to be condensed there. The distiller was double-slope with a double pass capillary film distiller. Is effective base area was 1m2 and its cover slope was 65° to the horizontal. The results showed that combining a capillary film distiller with basin type solar still caused an improvement in the still performance. The proposed still of two parallel cells with 50-mm gaps is theoretically predicted to produce 11.8 kgm-2d-1 on a sunny day of daily solar radiation of 42.5 MJ m-2d-1 on the glass cover.
Keywords	Solar, Distillation, Capillary film, Cover cooling, multiple-effect.