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Editorial

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Editorial

TEN YEARS OF THE ELECTRONIC JOURNAL OF DIFFERENTIAL EQUATIONS

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Editorial

LAUNCHING A NEW JOURNAL

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Editorial

WELCOMING MESSAGE FROM AN EDITORIAL BOARD MEMBER

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STRANG-TYPE PRECONDITIONERS FOR SOLVING SYSTEM OF ODES BY BOUNDARY VALUE METHODS

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Abstract: In this paper, we survey some of the latest developments in using boundary value methods for solving systems of ordinary differential equations with initial values. These methods require the solutions of one or more nonsymmetric, large and sparse linear systems. The GMRES method with the Strang-type preconditioner is proposed for solving these linear systems. One of the main results is that if an A , -stable boundary value method is used for an m-by-m system of ODEs, then the preconditioner is invertible and the preconditioned matrix can be decomposed as $I + L$ where I is the identity matrix and the rank of L is at most $2m($,+ $)$. It follows that when the GMRES method is applied to solving the preconditioned systems, the method will converge in at most $2m($,+ $) + 1$ iterations. Applications to differential algebraic equations and delay differential equations are also given.

Keywords: Boundary value method, GMRES, ordinary differential equation, Strang-type preconditioner
AMS Mathematical Subject Classification: 65L05, 65L06, 65N10, 65N22

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ON THE ANALYSIS OF A VISCOPLASTIC CONTACT PROBLEM WITH TIME DEPENDENT TRESCA'S FRICTION LAW

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Abstract: This papet deals with the study of a nonlineat problem of fiictional contact between an elastic-viscoplastic body and a tigid obstacle. We model the fiictional contact by a vetsion of Ttesca's fiiction law whete the fiiction bound depends on time. Fitstly, we obtain an existence and uniqueness tesult in a weak sense fot a model including the bilatetal contact. To this end we use a time disctetization method and the Banach fixed-point theotem. Secondly, we show an existence tesult fot a mechanical problem with the unilatetal contact conditions (Signotini's contact) using an itetative method

Keywords: Quasistatic fiictional contact, bilatetal contact, unilatetal contact, Ttesca's fiiction law, fixed point, disctetization
AMS Mathematical Subject Classification: 74D10, 74A55, 49B40

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EXISTENCE RESULTS FOR IMPULSIVE FUNCTIONAL AND NEUTRAL FUNCTIONAL DIFFERENTIAL INCLUSIONS WITH LOWER SEMICONTINUOUS RIGHT HAND SIDE

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Abstract: In this paper, Schaefer's fixed point theorem combined with a selection theorem due to Bressan and Colombo is used to investigate the existence of solutions for first and second order impulsive functional and neutral differential inclusions with lower semicontinuous and nonconvex-valued right-hand side.

Keywords: Impulsive differential inclusions, selection, existence, fixed point
AMS Mathematical Subject Classification: 34A37, 34A60

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A FAST ALGORITHM FOR BLIND CHANNEL IDENTIFICATION

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Abstract: In this paper, we address the problem of restoring a signal from its noisy convolutions with two unknown channels. When the transfer functions of these two channels have no common factors, the blind channel identification problem can be solved by finding the minimum eigenvalue of the Toeplitz-block matrix and its corresponding eigenvector. We present a fast algorithm to solve the numerical solution of the eigenvalue problem for Toeplitz-block matrices. Experimental results are given to illustrate the effectiveness of the method.

Keywords: Blind channel identification, Toeplitz-block matrix, eigenvalues
AMS Mathematical Subject Classification: 65F10, 65Y20

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NIR EMISSION SPECTRA OF (ER^{3+}: YB^{3+}) DOPED SIO_2-TIO_2-AL_2O_3 SOL-GEL GLASSES

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Abstract: The present paper reports the near infrared (NIR) emission spectra of Er^{3+}: Yb^{3+} co-doped SiO_2-Al_2O_3-TiO_2 sol-gel glasses. Upon optical pumping either with 980nm(Diode Laser) or 488nm (Ar^+ ion laser), the NIR emission transition ($^4I_{13/2} \rightarrow {}^4I_{15/2}$) at 1550nm of ($Er^{3+}$:$Yb^{3+}$) glasses have revealed an improved intensity by many times compared with the Er^{3+} singly doped sol-gel glass. The dependence of the emission intensity and lifetimes on the Yb^{3+}/Er^{3+} values and also the Er^{3+} concentration change has been investigated.

Keywords: (Er^{3+}:Yb^{3+}) sol-gel glasses-emission spectra
PACS: 81.20F; 32.30; 78.55

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STRUCTURAL AND TEM ANALYSIS OF $ZN_{1-X}MN_XTE$ CRYSTALS

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Abstract: Single crystals of $Zn_{1-x}Mn_xTe$ have been grown using vertical Bridgman growth technique. XRD analysis supports the zincblende structure of $Zn_{1-x}Mn_xTe$. As the concentration of Mn increases ($x > 2.5$), the single crystalline nature deteriorates (i.e grain size decreases) and polycrystalline nature with zincblende and hexagonal phases have been observed from x-ray diffractograms. This is supported by Transmission Electron Microscopic study of the samples. Surface morphology is studied from optical microscopic studies.

Keywords: $Zn_{1-x}Mn_xTe$ (ZMT)Crystals, Transmission electron microscopy (TEM), Bridgman growth technique, Optical microscopy.
PACS: 81.20F; 32.30; 78.55

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CONDENSATION ON IONS

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Abstract: The transition of a homogeneous system into a heterogeneous one may occur spontaneously in a labile region of supersaturations; in the metastable region of supersaturations it is realized as an energy barrier-determined process. The limit that separates the labile region from the metastable one is the *boundary supersaturation* $s_b >> s_c$, where s_c is the *critical supersaturation*. The Ω-potential thermodynamic formalism, $\Omega = F - G$, where F and G are the Helmholtz and the Gibbs free energies, respectively, allows a straightforward derivation of the formula of Tolman for and Volmer (1938) for a nucleus formation on an ion. For the case of charged liquid drops, expressions for the capillary pressure, the vapor pressure, the work of formation of equilibrium drops from vapors, and the drop surface tension, are obtained as well. The stability conditions for the charged equilibrium drops are also examined.

Keywords: Nucleation, charged drops, critical supersaturation, boundary supersaturation, thermodynamics, Ω- potential
PACS: 82.60.N Thermodynamics of nucleation