



RECENT RESEARCHES in MECHANICS, TRANSPORTATION and CULTURE

**6th WSEAS International Conference on APPLIED and
THEORETICAL MECHANICS (MECHANICS '10)
International Conference on AUTOMOTIVE and
TRANSPORTATION SYSTEMS (ICAT '10)
International Conference on ARTS and CULTURE (ICAC '10)**

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Preface

This year the 6th WSEAS International Conference on APPLIED and THEORETICAL MECHANICS (MECHANICS '10), the International Conference on AUTOMOTIVE and TRANSPORTATION SYSTEMS (ICAT '10) and the International Conference on ARTS and CULTURE (ICAC '10) were held in Vouliagmeni, Athens, Greece, December 29-31, 2010. The conferences remain faithful to their original idea of providing a platform to discuss mechanics of nanomaterials, fluid-structure interaction, impact and multibody dynamics, dynamic instability and buckling, manufacturing processes, mechatronics, aerodynamics and aeroelasticity, heat and mass transfer, aerodynamics, electric and hybrid vehicles, electronic transport, heavy vehicle systems, powertrains, vehicle design, creative computing, cultural management, digital culture and electronic tourism, entertainment technology and management, architecture, social science etc. with participants from all over the world, both from academia and from industry.

Their success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of these conferences are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

Conferences such as these can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

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Plenary Lecture 1

Radiative Properties of Nanoscale Multilayer Structures



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IRAN

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Abstract:

In order to achieve high-accuracy temperature measurements in rapid thermal processing (RTP), it is critical to be able to determine the radiative properties of silicon wafers with thin-film coatings such as silicon dioxide and silicon nitride. In this work, the directional, spectral, and temperature dependency of the radiative properties for the Nanoscale multilayer structures are modeled consisting of silicon and related materials such as silicon dioxide, and silicon nitride. This work discusses on visible and infrared wavelengths.

Infrared imaging is used extensively for both military and civilian purposes using radiative properties of silicon and other relevant materials. Military applications include target acquisition, surveillance, night vision, homing and tracking. Non-military uses include thermal efficiency analysis, remote temperature sensing, short-ranged wireless communication, spectroscopy, and weather forecasting.

This work uses the transfer-matrix method for calculating the radiative properties of silicon. For this purpose, doped silicon is used, the coherent formulation is applied, and the Drude model for the optical constants of doped silicon is employed. Results show that average reflectance changes from 0.3015 to 0.2060 for donor concentrations of 10^{17} cm^{-3} and 10^{19} cm^{-3} , respectively, indicating that average reflectance decreases with increasing concentration.

A donor concentration of 10^{19} cm^{-3} yields an average emittance of about 2.46 times higher than that yielded by a concentration level of 10^{17} cm^{-3} . An acceptor concentration of 10^{19} cm^{-3} has an average emittance of about 2.14 higher than that of a concentration equal to 10^{17} cm^{-3} .

At infrared wavelengths, lower reflectance occurs at higher concentrations and emittance increases with increasing concentration. Results also show that donors and acceptors act similarly with respect to spectral radiative properties at infrared wavelengths.

Brief Biography of the Speaker:

EDUCATION

2004–Now Ph.D. degree in Fluid Mechanics Engineering

Dept. of Mechanical Engineering, Isfahan University of Technology

Subjects studied included: Advanced Mathematics EE, Viscous Flow, Turbulent Flow, Hydrodynamics Instabilities, Radiation Heat Transfer, Boundary Layer, Advanced Gas Turbine, and Parallel Programming. Ph.D. thesis: "An Investigation and Simulation of Nano-Scale Materials Heat Transfer"

Recent Papers:

- Oloomi, S.A.A, Sabounchi, A and Sedaghat, A. "Predict Thermal Radiative Properties of Nanoscale Multilayer Structures", "the IASTED International Conference on Nanotechnology and Applications", pp. 113-118, Crete-Greece, (2008).

- Oloomi, S.A.A, Sabounchi, A and Sedaghat, A. "Computing Thermal Radiative Properties of Nanoscale Multilayer", "World Academy of Science, Engineering and Technology", vol. 37, pp. 922-928, (2009).
- Oloomi, S.A.A, Sabounchi, A and Sedaghat, A. "Modeling Thermal Radiative Properties of Nano scale Multilayer with Incoherent Formulation ", "World Academy of Science, Engineering and Technology", vol. 37, pp. 929-934, (2009).

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Research Interests:

- NanoScaled Material Properties
- NanoScaled Energy Transport
- NanoScaled System Heat Transfer Mechanisms
- Heat Transfer
- Parallel Programming
- Computational Fluid Mechanics

Plenary Lecture 2

Comparison between Functional Angles of Cutting Tools at Turning and Face Milling Operation



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Abstract: The paper makes a comparison between the functional angles at parting by turning and face milling operation where is taking into account the importance of correct position of the tool. In the same time is shown that at face milling operation in comparison with turning operation the functional angles have not decisive importance on the cutting process due to small variation of them in comparison to constructive angles.

Brief Biography of the Speaker: Valentin Ditu is professor at the Faculty of Technological Engineering and Manufacturing Technology Department of Transilvania University of Brasov Romania. He graduated in 1975 and he obtained his PhD. In the field of special effects that appears at cutting operations. He is author and co-author of 10 books and more than 100 papers in national and international conferences. He is author of 18 practical achievements and author of some invention licences. His research interests are in Manufacturing engineering processes, Management and Education technology. He worked in many projects with different factories in the field of cutting tools performances.

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