

Proceedings of the ASME

**10TH BIENNIAL CONFERENCE ON
ENGINEERING SYSTEMS
DESIGN AND ANALYSIS
— 2010 —**

VOLUME 2

**APPLIED MECHANICS
HEAT TRANSFER
SCIENCE, ENGINEERING AND EDUCATION**

presented at

THE ASME 2010 10TH BIENNIAL CONFERENCE ON ENGINEERING SYSTEMS DESIGN AND ANALYSIS
JULY 12–24, 2010
ISTANBUL, TURKEY

sponsored by
ASME — PETROLEUM DIVISION

A S M E

Three Park Avenue ♦ New York, N.Y. 10016

CONTENTS

APPLIED MECHANICS

ESDA2010-24007	1
Fundamental Frequency Optimization of Angle-Ply Laminated Plates Using Elitist-Genetic Algorithm and Finite Strip Method <i>Mohammad Homayoun Sadr and Hadi Ghashochi Bargh</i>	
ESDA2010-24021	11
An Effect of Plastic Anisotropy on the Strain Rate Intensity Factor <i>Sergei Alexandrov</i>	
ESDA2010-24100	17
Parallel Mechanism for Precision Sun Tracking <i>Stefano Mauro and Cristina Scarzella</i>	
ESDA2010-24101	23
The Dynamical Behavior of Y-Shaped Tubes Conveying Fluid <i>Ahmed A. Al-Rajihy and Hazim U. Alwan</i>	
ESDA2010-24106	29
On Shear Correction Factor in Vibration of Annular Sector Plates <i>F. Hejripour, A. R. Saidi, and S. H. Mirtalaie</i>	
ESDA2010-24138	39
Bending Analysis of Thin Skew Plates Using Extended Kantorovich Method <i>M. H. Kargarnovin, and A. Joodaky</i>	
ESDA2010-24139	45
Exact Electroelastic Field of a Functionally Graded Piezoelectric Cantilever Beam Subjected to Pure Body Force Loading <i>A. A. Emami, R. Hashemi, M. H. Kargarnovin, and R. Naghdabadi</i>	
ESDA2010-24188	53
Weak Radiator Design Using Dimples <i>Wen Nan Cheng, Chih Chun Cheng, and Gary H. Koopmann</i>	
ESDA2010-24190	61
Numerical and Experimental Studies of High Strain Rate Mechanical Behavior of E-Glass/Polyester Composite Laminates <i>Gozde Tunusoglu, Alper Tasdemirci, Mustafa Guden, and I. W. Hall</i>	
ESDA2010-24202	69
Fatigue Life Improvement of Antiroll Bar Bracket Used in Heavy Truck Suspension <i>Ali Cinar and Kader Senocak</i>	
ESDA2010-24206	73
Stamina of a Gasketed Flange Joint Under Combined Internal Pressure and Axial Loading <i>Muhammad Abid and Niaz Bahadur Khan</i>	

ESDA2010-24219	81
On the Axisymmetric Torsional Wave Dispersion and Its Controlling in the Finitely Pre-Stretched Bi-Material Compound Circular Cylinder	
<i>Tamer Kepceler and M. Mert Egilmez</i>	
ESDA2010-24230	91
On Some Particularities of the Axisymmetric Wave Propagation in the Initially Twisted Circular Compound Cylinders	
<i>Surkay Akbarov, Mugan Guliev, and Tamer Kepceler</i>	
ESDA2010-24257	99
Large Deflection of a Non-Linear, Elastic, Asymmetric Ludwick Cantilever Beam	
<i>Alberto Borboni, Diego De Santis, and Rodolfo Faglia</i>	
ESDA2010-24340	107
3-D Free Vibration Analysis of Functionally Graded Thick Circular and Annular Plates on Elastic Foundation	
<i>Vahid Tajeddini, Abdolreza Ohadi, and Mojtaba Sadighi</i>	
ESDA2010-24395	117
On the Stress Singularities and Boundary Layer in Moderately Thick Functionally Graded Sectorial Plates	
<i>A. R. Saidi, F. Hejripour, and E. Jomehzadeh</i>	
ESDA2010-24452	127
On Measuring Dynamic Properties of Damping Materials Using Oberst Beam Method	
<i>Hasan Koruk and Kenan Y. Sanliturk</i>	
ESDA2010-24575	135
Numerical Simulation of Elastic and Thermoelastic Wave Propagation in Two-Dimensional Classical and Generalized Coupled Thermoelasticity	
<i>S. K. Hosseini zad, A. Komeili, A. H. Akbarzadeh, and M. R. Eslami</i>	
ESDA2010-24576	147
On the Avoidance of Friction Induced Vibrations by Structural Optimization	
<i>Gottfried Spelsberg-Korspeter</i>	
ESDA2010-24587	153
The Effect of Fiber Arrangement on Stress Concentration Around a Pin in a Laminated Composite Joint	
<i>Mohammad Shishesaz, Mohammad Mehdi Attar, and Hosein Robati</i>	
ESDA2010-24594	163
Buckling Analysis of Thin Functionally Graded Rectangular Plates Resting on Elastic Foundation	
<i>Meisam Mohammadi, A. R. Saidi, and Mehdi Mohammadi</i>	
ESDA2010-24680	171
Fatigue Reliability Assessment of Marine Risers in Deep Offshore Fields in Indian Ocean	
<i>Rizwan A. Khan and Suhail Ahmad</i>	

ESDA2010-24685	183
A Study on the Buckling Characteristics of Conical Shell Using Differential Quadrature Method	
<i>E. Jomehzadeh, S. H. Mirtalaie, and H. Noori</i>	
ESDA2010-24705	193
Buckling Delamination of the Rectangular Orthotropic Thick Plate With an Edge Rectangular Crack	
<i>Surkay Akbarov, Nazmiye Yahnioglu, and Esra Eylem Karatas</i>	
ESDA2010-24713	201
Mechanical Design and Analysis of an Intelligent Oil Well Sensory System	
<i>Atefeh Salmasi, Aghil Yousefi-Koma, and Mohammad Hossein Soorgee</i>	
ESDA2010-24720	207
The Performance of Bolted Slant Endplate Connections Subjected to Temperature Increase	
<i>F. Zahmatkesh and E. Talebi</i>	
ESDA2010-24739	219
Theoretical and Experimental Crushing Analysis of Metal Square Honeycombs Under Quasi-Static Loading	
<i>M. Zarei Mahmoudabadi, M. Sadighi, and A. Eyvazian</i>	
ESDA2010-24759	227
How Geometrical Tolerances Affect the Measurement of Reciprocal Alignment of Two Different Assemblies: A Case Study	
<i>David Vetturi, Matteo Lancini, and Illeana Bodini</i>	
ESDA2010-24782	233
Experimental Study of Corrugated Tubes Under Lateral Loading	
<i>A. Eyvazian, M. Shakeri, and M. Zarei Mahmoudabadi</i>	
ESDA2010-24807	243
Buckling Delamination of a Rectangular Sandwich Thick Plate With Band Cracks	
<i>Surkay Akbarov, Nazmiye Yahnioglu, and Ayfer Tekin</i>	
ESDA2010-24814	253
Bifurcation Analysis for Brake Squeal	
<i>Hartmut Hetzler</i>	
ESDA2010-24841	263
An Optimal Parameters Determination for Ferroelectric's Polarization Model	
<i>A. Scaliukh, A. Soloviev, E. Dmitrieva, and M. Shevtsova</i>	
ESDA2010-24861	271
Coupled Axial-Flexural-Torsional Vibration of Internally Damped Timoshenko Frames	
<i>Adil Yucel, Alaeddin Arpacı, and Ekrem Tufekci</i>	
ESDA2010-24875	279
Structural Analysis of Riveted Structures Using a New FE Modelling Technique	
<i>Michele Ferracci, Francesco Vivio, and Vincenzo Vullo</i>	

ESDA2010-24906	287
Vibration Analysis of Rectangular Functionally Graded Plate Bonded With PZT5 Sensor/Actuator	
<i>M. H. Kargarnovin and N. S. Viliani</i>	
ESDA2010-24972	295
Improvement of Cyclic Strength of Carbon Steel by Various Surface Treatments	
<i>Antanas Ciuplys</i>	
ESDA2010-25003	299
Mechanical Assessment of Maglev Vehicle: A Proposal for Implementing Maglev Trains in Iran	
<i>Hamid Yaghoubi and M. Sadat Hoseini</i>	
ESDA2010-25021	307
Dynamic Stability of a Spinning Timoshenko Beam Subjected to a Moving Mass-Spring-Damper Unit	
<i>T. H. Young and M. S. Chen</i>	
ESDA2010-25030	317
Experimental and Numerical Analysis of Fatigue Properties Improvement in a Titanium Alloy by Shot Peening	
<i>Sara Bagherifard, Marco Giglio, Lorenzo Giudici, and Mario Guagliano</i>	
ESDA2010-25087	323
Improving Performance of an Artificial Neural Network Based Gearbox Fault Diagnosis System	
<i>Ali Hajnayeb, Ahmad Ghasemloonia, Siamak Esmaeelzadeh Khadem, and Mohammad Hasan Moradi</i>	
ESDA2010-25089	329
On Active Diagnostics Method for Assessment of Technical Condition of Nuclear Facility Components	
<i>Yury Spirochkin, Igor Odintsev, and Roman Atroshenkov</i>	
ESDA2010-25113	335
Study of the Burn-Through During In-Service Welding of T Joint Branch Connections	
<i>A. H. Daei-Sorkhabi, M. A. Saeimi-Sadigh, F. Vakili-Tahami, M. Zehsaz, and B. Behjat</i>	
ESDA2010-25193	345
An Analytical Study to Free Vibration Control of Composite Beams With Piezoelectric Layers Based on First Order Shear Deformation Theory	
<i>Ali Abbaszadeh Bidokhti</i>	
ESDA2010-25213	351
Stress Analysis of an Isotropic Plate Containing Three Aligned Circular Holes Under In-Plane Symmetric Loading	
<i>Ghazi H. Asmar and Elie A. Chakar</i>	
ESDA2010-25218	359
A Method for Thermal Loading Design to Reduce Stresses	
<i>H. Soltani, M. R. Hematiyan, and K. Jafarpur</i>	

ESDA2010-25246	365
Dynamic Analysis of Surface Scanning for Tactile Perception	
<i>Ramona Fagiani, Francesco Massi, Eric Chatelet, and Yves Berthier</i>	
ESDA2010-25247	375
Dynamics of Rupture at Frictional Rough Interfaces During Sliding Initiation	
<i>Mariano Di Bartolomeo, Francesco Massi, Anissa Meziane, Laurent Baillet, and Antonio Culla</i>	
ESDA2010-25248	385
Experimental and Numerical Investigation of Grooved Thin-Walled Steel Cylinders Under Axial Compression	
<i>Arshia Pakizehkar, Mirhamed Sarkarfarshi, and Abolfazl Masomi</i>	
ESDA2010-25249	393
The Effect of Drilling Mud on Nonlinear Instability Threshold of Drill String	
<i>Ali Asghar Jafari, Reza Kazemi, and Mohammad Faraji Mahyari</i>	
ESDA2010-25430	403
Analysis of Spatial Steady-State Vibrations of a Layered Anisotropic Plate Using the Green's Functions	
<i>Alexander Karmazin, Evgenia Kirillova, Wolfgang Seemann, and Pavel Syromyatnikov</i>	
ESDA2010-25450	411
Does a Predictive Minimal Model of Friction-Induced Vibration Exist?	
<i>Tore Butlin and Jim Woodhouse</i>	
HEAT TRANSFER	
ESDA2010-24018	421
Experimental Investigation of Thermal Performance of Vapor Chamber Heat Sinks	
<i>Hung-Yi Li, Ming-Hung Chiang, Chih-I Lee, and Wen-Jei Yang</i>	
ESDA2010-24070	427
Experimental Study of Free Convection Heat Transfer From a Fin Attached Cylinder Confined Between Tilt and Low Conductive Plates	
<i>Amir Abbas Rezae, Masoud Ziabasharhagh, Tooraj Yousefi, and Mehran Ahmadi</i>	
ESDA2010-24077	433
Laminar Mixed Convection in Horizontal Concentric Annuli With Four Porous Blocks Attached on the Outside of the Inner Cylinder	
<i>Yacine Ould-Amer</i>	
ESDA2010-24115	443
Experimental Study on the Heat Transfer Under Impinging Jet Array Using Liquid Crystal Thermograph	
<i>Han-Chieh Chiu, Jer-Huan Jang, and Wei-Mon Yan</i>	
ESDA2010-24124	453
Influence of Ambient Air Velocity Orientation in Thermal Behaviour of Open Refrigerated Display Cabinets	
<i>Pedro Dinis Gaspar, L. C. Carrilho Gonçalves, and Xiao Ge</i>	

ESDA2010-24144	463
An Experimental Study on the Effect of Partition Angle on Free Convection Heat Transfer in a Partition Cavity by Laser Interferometry Method	
<i>Tooraj Yousefi, Sajjad Mahmoodi Nezhad, Masood Bigharaz, and Saeed Ebrahimi</i>	
ESDA2010-24154	469
Natural Convective Characteristics of an Oblique Heat Source Module in the Closed and Ventilated Cabinets	
<i>Yeong-Ley Tsay, Jen-Chieh Cheng, and Yong-Lin Zhuang</i>	
ESDA2010-24196	477
Heat Transfer Measurements of Compact High Power LED Illumination Cooled by Different Fluids	
<i>Rong-Yuan Jou</i>	
ESDA2010-24197	487
Study of the Freezing Chuck for Non-Traditional Clamping Applications	
<i>Rong-Yuan Jou</i>	
ESDA2010-24218	497
Numerical Simulation of One-Dimensional Hyperbolic Heat Conduction Equation in Longitudinal Fins With Different Profiles	
<i>Keivan Bamdad Masouleh, Hossein Ahmadikia, and Aziz Azimi</i>	
ESDA2010-24240	505
The Effect of Triangular Vortex Generators on Turbulent Flow and Heat Transfer in a Channel	
<i>Hosseinali Soltanipour, Iraj Mirzaei, and Parisa Choupani</i>	
ESDA2010-24269	511
Development of a Computer Program for the Numerical Investigation of Heat Transfer in a Gasketed Plate Heat Exchanger	
<i>Gizem Gulben, Selin Aradag, Nilay Sezer-Uzol, and Ufuk Atamturk</i>	
ESDA2010-24353	519
An Experimental Investigation of Forced Convection Heat Transfer From an Isothermal V-Shaped Plate	
<i>Tooraj Yousefi, Saeed Ebrahimi, Masood Bigharaz, and Sajjad Mahmoodi Nezhad</i>	
ESDA2010-24362	525
Impinging Jet Cooling Optimization for Obtaining Uniform Heat Flux	
<i>Farshad Kowsary, Hamed Gholamian, and Mehran Rajaeian Hoonejani</i>	
ESDA2010-24402	535
Second Law Analysis of Fully Developed Convection in a Helical Coiled Tube Under Constant Wall Temperature Using a CFD-ANN Approach	
<i>Mostafa Emami, Saeed Alem Varzane Esfehani, and Mohammad H. Rahimian</i>	
ESDA2010-24416	541
Natural Convection-Radiation Heat Transfer in Rectangular Cavity With the Presence of Participating Media	
<i>Behnam Moghadassian, Farshad Kowsary, and Hamed Gholamian</i>	

ESDA2010-24441	551
Integrated Numerical and Experimental Study on the Thermal Management for LED Daytime Running Lamp	
<i>Sheam-Chyun Lin, Ming-Chou Shen, Kuang-Ting Cheng, Jin-Tsing Hong, and Hsien-Chang Shih</i>	
ESDA2010-24466	561
Coherent Flame Model to Predict Formation Pollutants in Turbulent Premixed Flame	
<i>Abdelhalim Bentebbiche and Denis Veynante</i>	
ESDA2010-24467	567
Estimation of the Heat Generation in a Cutting Tool Using a Sequential Inverse Method	
<i>Forooza Samadi, Farshad Kowsary, Mohsen Hamed, and Araz Sarchami</i>	
ESDA2010-24476	573
Experimental Investigation on the Heat Transfer of a Portable Forced-Convection Solar Air Heater	
<i>Mohammad Fakoor Pakdaman, Pejman Zohorian Izadi, Mohammad Javadinia Azari, and Amir Lashkari</i>	
ESDA2010-24485	583
Experimental Analysis of Internal Heat Exchanger for Automotive A/C System	
<i>Salman Bahrami, Hasan Mohammad Beigi, and Mohammad Hosein Sabour</i>	
ESDA2010-24493	591
Experimental and Numerical Analysis of Carbon Black Formation in Hydrocarbon/Air Diffusion Flames	
<i>D. F. Heravi, Amirhomayun Samiee, H. M. Heravi, Kazem Bashirnezhad, and Hassan Sanaei</i>	
ESDA2010-24544	601
Effect of Viscous Dissipation on Heat Transfer Between Two Concentric Cylinders for Carreau Fluids	
<i>Meriem Amoura and Noureddine Zeraibi</i>	
ESDA2010-24570	607
Thermally Developing 3D Cross Flow Between Cross Corrugated Parallel Plates in Evaporative Coolers	
<i>Ehsan Tavakoli and Reza Hosseini</i>	
ESDA2010-24651	615
Application of Modified Discrete Ordinates Method With the Concept of Blocked-Off Region Method to Radiative Heat Transfer Problems in Irregular Geometries	
<i>H. Amiri, S. H. Mansouri, and A. Safavinejad</i>	
ESDA2010-24661	627
Numerical Simulation of Turbulent Heat Transfer on a Rotating Disk With an Impinging Jet	
<i>M. H. Saidi, H. Karrabi, H. B. Avval, and A. Asgarshamsi</i>	
ESDA2010-24687	633
Application of Modified Discrete Ordinate Method to Combined Conductive and Radiative Heat Transfer Problems in Irregular Geometry	
<i>H. Amiri, S. H. Mansouri, and A. Safavinejad</i>	

ESDA2010-24712	643
Comparison of Gasketed Plate Heat Exchangers With Double Pipe Heat Exchangers	
<i>Cankur Fırat Cetinbas, Burak Ahmet Tuna, Cevat Akin, Selin Aradag, and Nilay Sezer Uzol</i>	
ESDA2010-24760	653
Heat Transfer on Parallel Plate Heat Exchangers in an Oscillatory Flow	
<i>Xiaoan Mao, Lei Shi, Artur J. Jaworski, and Wasan Kamsanam</i>	
ESDA2010-24820	663
Parametric Study of an Innovative Counter-Flow Heat Exchanger	
<i>Luciano Andrea Catalano, Fabio De Bellis, and Riccardo Amirante</i>	
ESDA2010-24892	671
On the Use of POD-Models for Convective Flow in a Grooved Channel	
<i>Sertac Cadirci and Hasan Gunes</i>	
ESDA2010-24961	679
The Two Phase Jet Use for Surroundings Changes in Semi-Open Space	
<i>Alexandru Chisacof, Valeriu Panaitescu, Dragoș Pavel, and Mihai Poenaru</i>	
ESDA2010-25042	687
Investigation of Heat Transfer Over a Rotating Disk in Case of Temperature and Velocity	
Jump Conditions by Using Differential Transform Method	
<i>A. Y. Gunes, G. Komurgoz, A. Arikoglu, and I. Ozkol</i>	
ESDA2010-25080	695
3D Thermal Analysis of a Power Supply Busbar Structure	
<i>Adrian Plesca and Alina Scintee</i>	
ESDA2010-25173	703
Non-Isothermal Fluid Flow in a Continuous Casting Tundish	
<i>Amel F. Boudjabi, Ahmed Bellaouar, Mohammed Lachi, and Nadim El Wakil</i>	
ESDA2010-25192	711
Second Law Analysis of Nanofluid Flow Through Circular Pipe	
<i>H. Shokouhmand, M. Moghaddami, and M. Siavashi</i>	
ESDA2010-25235	719
Convective Heat Transfer Enhancement With Nanofluids: The Effect of	
Temperature-Variable Thermal Conductivity	
<i>Sezer Özerinç, Almila G. Yazıcıoğlu, and Sadık Kakaç</i>	
ESDA2010-25237	733
Analysis of Single Phase Convective Heat Transfer in Microchannels With Variable Thermal	
Conductivity and Viscosity	
<i>Arif Cem Gözükara, Almila G. Yazıcıoğlu, and Sadık Kakaç</i>	
ESDA2010-25336	743
A Compact Nanostructure Enhanced Heat Sink With Flow in a Rectangular Channel	
<i>Muhsincan Sesen, Berkay Arda Kosar, Ali Kosar, Wisam Khudhayer,</i>	
<i>Berk Ahmet Ahishalioglu, and Tansel Karabacak</i>	

ESDA2010-25363	749
Thermal and Fluid Dynamic Analysis on Impinging Jet for Aircraft Anti-Icing <i>Assunta Andreozzi, Fabio Lucibello, Oronzio Manca, Sergio Nardini, and Mario Roma</i>	
ESDA2010-25374	757
The Improvement of Cooling Performance of a Flash Pumped Laser Using Nd:YAG <i>A. Berkan Erdoğmuş, Murat Şahin, Ali Murteza Çolakoğlu, and Birol Erentürk</i>	
ESDA2010-25432	765
Experimental Investigation of Heat Transfer and Pressure Drop for Two-Phase R-134A Flow in a 1.65 MM Copper Tube <i>Bilgehan Tekin, Almila G. Yazıcıoğlu, Hüsnü Kerpiççi, and Sadık Kakaç</i>	
SCIENCE, ENGINEERING AND EDUCATION	
ESDA2010-24057	775
Some Models and Methods to Nurture General Management Skills in Engineering Students Living in Large Residential Communities <i>Varghese Panthalookaran and Binu R.</i>	
ESDA2010-24143	781
Application of Ethics Criteria to Engineering Profession: Case Study of Engineering Students at the UAE University <i>Mohamed Y. E. Selim and Mohamed A. Al-Bayywomi</i>	
ESDA2010-24213	793
The Virtual Laboratory of Program Control <i>Peter Kostal, Andrea Mudrikova, and Dagmar Caganova</i>	
ESDA2010-24494	803
Development of Competitive Skills in Future Mechanical Engineers <i>F. Jorge Lino and Teresa P. Duarte</i>	
ESDA2010-24502	811
Historical Progression of Mathematizing Vibro-Acoustic Problems <i>Mete Öğütç</i>	
ESDA2010-24727	815
Non Destructive Testing of Low Profile Light Weight Rail Track System <i>Hassan Al Nageim</i>	
ESDA2010-24827	823
Control Theory in Practice: Magnetic Levitation <i>John Rogers and Robert Rabb</i>	
ESDA2010-24883	831
A Successful Model of Cooperation Between a Public University and Industrial Companies Through a Hybrid Public/Private R&D Institute <i>F. Jorge Lino and A. Barata da Rocha</i>	
Author Index.....	841