## **Mechanical Engineering**

# **Sharif**

Spring 2020

Editor-in-Chief: Mohammad Taghi Ahmadian

This Journal is published under the auspices of Sharif University of technology, Office of the Vice-Chancellor-in-Charge of Research.

The Journal is published semiannually in Farsi language, aims at establishing a relationship between scientists active in different branches of science and technology and, in particular, at providing a forum for exchange of knowledge between scientists and technologists related to scientific problems prevailing in contemporary society. The journal also strives to present practical and theoretical analyses of these issues and facilitates the circulation of modern scientific findings by scientists and researchers for practical application. In addition, "Sharif" publishes original papers focusing on issues of specific concern to universities, including research, technological advancements, and topics related to matters of higher education.

P.O.BOX 11155-8639 AZADI AVENUE, TEHRAN, I.R. IRAN
Phone: (98-21) 66005419 - 66164093 Fax: (98-21) 66012983

 $Web: \ http://journal.sharif.ir/ \qquad http://\ www.\ globalscience journals.com$ 

E-mail: pajouhesh@sharif.edu

### CONTENTS

- 3 PASSIVE CONTROL OF TURBULENT FLOW AROUND A CYLINDER USING COMBINATION OF SPLITTER PLATE AND CONTROL CYLINDER
  - S. A.R. Erfanian and A.R. Jahangirian
- 11 AGING HEAT TREATMENT AND SPECIMEN'S GEOMETRY: FRACTURE BEHAVIOR OF AL2024-T8 SHEET UNDER TENSION K. Pakravan and A. Hosseini Monazzah
- 19 INVESTIGATION OF DIFFERENT ASPECTS OF DBD PLASMA ACTUATORS ON AIRFLOW AROUND A WING
  S. Kabirian and A.R. Jahangirian
- 29 EXPERIMENTAL INVESTIGATION ON SPIN EFFECT UPON BURNING RATE OF ALUMINIZED COMPOSITE PROPELLANT

  A.R. Mohammadi, M. Farahani and M. Goodarz
- 35 THERMO-MECHANICAL ANALYSIS OF SINGLE AND FOUR-CORE YB:YAG FIBER LASERS UNDER END-PUMPING
  E. Amiri and M. Mojahedi
- 45 PREDICTION OF HEAT TRANSFER DETERIORATION ONSET OF TRANS-CRITICAL METHANE IN A RECTANGULAR CHANNEL A. Ebrahimi and M. Shokri
- 57 INVESTIGATION THE EFFECTS OF LEAN IN A CENTRIFUGAL PUMP IMPELLER ON ITS AERODYNAMIC PERFORMANCE
  A. Asgarshamsi, M. Rezazadeh and A. Iravani
- 67 AGILE FLIGHT VEHICLE FIN FAILURE TOLERANT CONTROL USING INERTIAL MEASUREMENT UNIT DATA

  A. Ashrafifar and M. Fathi Jegarkandi
- 77 EFFECT OF MULTIPHASE LATTICE BOLTZMANN COLLISION MODELS WITH SINGLE- AND MULTI-RELAXATION TIMES FOR SIMULATION OF LIQUID-VAPOR TWO-PHASE FLOWS USING TWO DIFFERENT FORCING SCHEMES
- 89 ANALYSIS AND OPTIMIZATION OF THE NGL PLANT USING THE EXTENDED BRIDGE EXERGY METHOD AND DIFFERENTIAL EVOLUTION ALGORITHM
  - F. Sadeghian Jahromi and M. Beheshti

E. Ezzatneshan and R. Goharimehr

- 99 HYDRODYNAMIC COEFFICIENTS ESTIMATION OF A PROLATE SPHEROID USING COMBINATION OF HYBRID EXTENDED KALMAN FILTER (HEKF) AND COMPUTATIONAL FLUID DYNAMICS (CFD)

  M. Rasekh and M. Mahdi
- 109 AN ANALYTICAL SOLUTION TO TWO-DIMENSIONAL UNSTEADY MASS TRANSFER EQUATION WITH ARBITRARY SOURCE TERM IN THE RIVER
  - N. Mashhadgarme, M. Mazaheri and J. MohammadVali Samani
- 121 EXPERIMENTAL INVESTIGATION AND NUMERICAL ANALYSIS OF NOVEL PROCESS TO PRODUCE OF HIGH STRENGTH BIMETAL TUBES BY RUBBER PAD TUBE STRAINING (RPTS) METHOD O. Shapourgan, Gh. faraji, J. Shahbazi Karami and S. Sadeghian

### RESEARCH NOTES:

131 NUMERICAL INVESTIGATION ON INCREASING THE MIXING INDEX IN AN ACTIVE MICRO MIXER BY TWO ROTATING CYLINDERS
S. Mohammad Bagery and M. Vajdi

#### APPENDIX

150 ABSTRACTS OF PAPERS IN ENGLISH