Maharaja Agrasen Institute of Technology, Delhi

Department of Mechanical and Automation Engineering

Department of Mechanical & Automation Engineering and Department of Mechanical Engineering, Maharaja Agrasen Institute of Technology organized an online webinar on the topic '**Augmentation of Heat Transfer in Internal Flow'** on 22nd January 2022. The event was started with the welcome address of Prof. Neelam Sharma, Director, MAIT who enlightened us with her inspirational and encouraging words. She emphasized the significance of research for the benefit of the students and the faculty.

The main theme of the event was based on the research work carried out by Dr. Sachin Gupta during his PhD. Dr. Sachin Gupta is working as an Assistant Professor in the Department of Mechanical and Automation Engineering (MAE) and Mechanical Engineering (ME) at Maharaja Agrasen Institute of Technology, New Delhi. Dr. Sachin is awarded with the Ph.D. degree from J. C. Bose University of Science & Technology, YMCA; Faridabad in the year 2021. He has done his M.Tech in Thermal Engineering in the year 2009 from NIT, Kurukshetra. Dr. Sachin has been involved in the research on experimental and numerical aspects of improving the efficacy of conjugate heat transfer through novel enhancements in heat exchangers. He has authored many research papers in International Journals and Conferences of repute.

Dr. Sachin Gupta presented a very informative talk on '**Augmentation of Heat Transfer in Internal Flow'**. The lecture focuses on the use of winglet as a vortex generator for augmenting the heat transfer for a heat exchanger. The talk started with the introduction of various types of winglets. Further, the use of rectangular winglet was very well explained along with the supporting literature. Dr. Sachin then explained the methodology used for achieving the research objectives. The speaker briefly explained the various configurations of winglet used for punched and non-punched cases of winglet. He then went on to explain the optimum configurations of winglet for maximum thermo-hydraulic performance of heat exchanger. The lecture concluded with the future scope of the research work. The speaker stressed the use of winglet with hole as a method for improving the performance.

Finally, the webinar was ended with a Q & A session. More than 50 participants attended for the same and the event was a grand success.

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

Maharaja Agrasen Chowk, Plot No. 1, Sector – 22, Rohini, Delhi – 110086.

DEPARTMENT OF MECHANICAL AND AUTOMATION ENGINEERING
&
DEPARTMENT OF MECHANICAL ENGINEERING

Presents

Webinar Series

Dr. Sachin Gupta, Speaker

Augmentation of Heat Transfer in Internal Flow

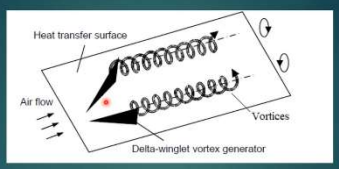
Dr. V. N. Mathur
Head
Department of Mechanical and Automation Engineering

Dr. Vaibhav Jain
Head
Department of Mechanical Engineering

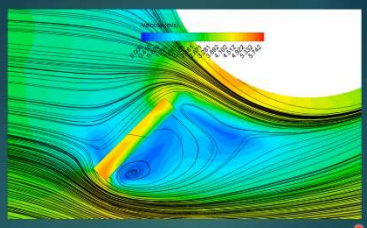
GUEST SPEAKER

Dr. Sachin Gupta
Department of Mechanical and Automation Engineering

Dr. Sachin Gupta is presently working as an Assistant Professor in the Department of Mechanical and Automation Engineering and Mechanical Engineering at Maharaja Agrasen Institute of Technology, Delhi. He has been recently awarded the Ph.D. degree from J. C. Bose University of Science & Technology, YMCA, Faridabad. Prior to working in MAIT, he worked at Vaish College of Engineering, Rohtak for 7 years. He has a total teaching experience of more than 14 years. As recognition of his academic achievements, he has received a Research Excellence award from YMCA, Faridabad for his research activities. Dr. Gupta's research interests lies in the experimental and numerical aspects of improving the efficacy of conjugate heat transfer through novel enhancements in heat exchangers. He has authored many research papers in reputed International Journals and Conferences. He is also in the reviewer board of few reputed International Journals.



Formation of Vortices



Streamline plot for CFU_U configuration
(flow Left to Right)

Outcomes of Research

- For localized performance study, CFD_U configuration exhibits the best thermohydraulic performance with an average improvement of 51.28% over the baseline case, whereas CFU_D configuration reported an average improvement of 6.56% over the baseline case for the same which is the lowest from among the considered configurations.
- For globalized performance study Winglet located in CFD_U configuration reported maximum augmentation in overall thermohydraulic performance with an average improvement of 62.47% over baseline case whereas CFU_U configuration reported the least augmentation with an average improvement of 6.25% over baseline case.

Scope for future work

- Present study can be extended for different types of tube like oval tube, flat tube etc.
- Present study considers only one tube for the investigation, but it can be extended for multiple tubes.
- Present study can also be extended for curved winglet for performance investigation.
- Present study considers rectangular winglet but we can also extends this work for delta winglet.