

## **IEEE IAS Distinguished Lecture and Inauguration of IIST IEEE IAS Student Branch Chapter at Indian Institute of Space Science and Technology by Dr. Akshay Rathore**

An IEEE-IAS Distinguished Lecture and the official inauguration of the IIST IEEE - Industry Application Society (IEEE-IAS) Student branch chapter at the Indian Institute of Space Science and Technology (IIST) was held on 14<sup>th</sup> May 2018 at Aerospace Block (D4), IIST campus. The Distinguished lecture was delivered by Dr. Akshay Kumar Rathore on Impulse Commutated Frequency Modulated Soft-switching Current-fed Converters.

IEEE IAS-IES-PEL Kerala joint chapter secretary Dr K. Biju and IEEE IAS-IES-PEL Kerala joint chapter conference chair Dr. Jaison Mathew were present during the event. IEEE-IAS Chairman Mr. Prasoon Chandran Mavila welcomed the guests and the participants to the program. IIST IEEE Student branch counsellor and Head of the Avionics Dept., IIST; Dr. Manoj B.S talked a few words about the student branch activities. Dr. Biju conveyed about the IAS-IES-PEL joint chapter programmes. Then Dr. Jayson Mathew talked about various conferences taking place under the societies and their importance. The program was chaired by Dr. Sudarshan Kaarthik, IEEE Industry Applications Society (IAS) student branch chapter Advisor and Assistant Professor of Avionics Department I.I.S.T. He introduced the speaker to the audience. Dr. Akshay Kumar Rathore started the Distinguished Lecture by giving a brief introduction about DC-DC converters. The program also included an interactive session after the talk, during which the participants cleared their doubts regarding the topic covered in the talk. Dr. Rajeevan P.P, Associate Professor of Avionics Department I.I.S.T gave felicitation speech. Mr. Sagar Kumar Dash, Executive Member, IIST IEEE IAS Student Branch Chapter delivered vote of thanks. The participants had a visit to Power Electronics Lab after the DL. The on-going as well as finished research projects were explained at the lab. Total 32 participants including students and professors attended the program.

### **Low-Voltage High Current Applications:**

Low-Voltage High Current Application was one of the major topic of the Distinguished Lecture. The various anomalies due to the voltage fed resonant converter were discussed and hence the importance of the Current-fed converters was discussed. The various issues with the current fed converters was tackled with the traditional solution of Snubber circuits and hence the topology of Current-fed converter with active clamp was introduced. The work with the Snubberless Naturally clamped Current-fed Converters was introduced along with its merits and demerits and the work that was done in the same topic. The DL also covered the various topologies for the Snubberless Current-Fed Converter.

### **Impulse Commutated Current-Fed Converters:**

The main content of the talk was started with a discussion on Low Voltage High Current Applications. The various applications were discussed along with the working of Impulse Commutated Current fed converters. This uni-directional class of current-fed converters attains soft-switching, zero current commutation, and voltage clamping of switches through a high-frequency resonant tank. It is a simple, cost-effective and easy way of solving the traditional turn-off voltage spike across the devices. Dr.Rathore has been working on the analysis, design and development of high-density soft-switching power electronic systems; in particular, current fed topologies and novel pulse-width modulation techniques for low voltage high current applications including renewables, distributed generation, micro-grid, and electric transportation. The merits and demerits of the Impulse Commutated Current fed converter topology was covered along with the operation and the Simulation results. The Design of the converter was discussed and the experimental results were shown.

### **Interactive session with the audience**

The DL was followed by an interactive session with the audience. Various challenges with the soft-switching, voltage fed converters were discussed. This was followed by a visit to the Power Electronics Lab. A brief introduction to all the working projects was done followed by an interactive discussion at the lab.



On the stage(from left): Dr. R. Sudharshan Kaarthik (Advisor ,IIST IEEE IAS SB Chapter, Asst. Prof. Avionics Dept.) , Dr. Manoj B.S (Counsellor ,IIST IEEE SB, H.O.D Avionics ) , Dr. Akshay Kumar Rathore(Distinguished Lecturer), Dr. Jaison Mathew(Conference Chair, IEEE IAS-IES-PEL joint chapter Kerala), Dr K.Biju (Secretary, IEEE IAS-IES-PEL joint chapter Kerala), Dr. Rajeevan PP, Associate Professor (Industry-academia interaction Chair).



Dr. Akshay Kumar Rathore giving the Distinguished Lecture



Power electronics research lab visit after DL