

理工学研究所

国際交流・公開研究セミナー

Animesh Maitra 博士（インド・カルカッタ大学教授）が来日される機会に、電波科学の重要な一分野であるマイクロ波リモートセンシングに関し、ご講演をお願いしました。是非ご参集ください。

題 目： Microwave Remote Sensing of Tropical Atmosphere :
Activities at Calcutta University

講演者： Prof. Animesh Maitra
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University of Calcutta
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日 時： 2016年10月29日（土）16:00～17:15

場 所： 中央大学後楽園キャンパス1号館2階1205号室



アブストラクト：

Sir J C Bose was the first to use microwaves for probing the quasi-optic properties electromagnetic waves in Kolkata in 1895. He, for the first time, conceived the idea of using the wavelengths in the range of centimeter to millimeter, later broadly known as “Microwaves”, for wireless systems and developed the devices and components suitable for these small wavelengths. This laid the foundation of modern microwave systems that found many-faceted applications, much later, in radio communication, radar and radio astronomy.

In more recent times, microwave radiations are used in a major way for remote sensing of earth’s environment for their inherent advantages of being sensitive to different atmospheric parameters, such as, rain, cloud, water vapour, in a unique manner. Hence, microwave systems are very suitable to study the convective events, heavy precipitation, thick clouds, vertical transport of water vapour, that are frequently observed in the tropical region. At tropical location like Kolkata (22.570 N, 88.370 S), which is in the eastern part of India, strong convective events mostly occur in the pre-monsoon period and monsoon period. The study and forecast of the convective processes are important as they affect human livings, aviation, agriculture, satellite and terrestrial communications. Also, convective processes have long term implications in the climate change scenario.

At the Institute of Radio Physics and Electronics, University of Calcutta, several ground based microwave instruments have operated during last ten years for a variety of atmospheric observations that include precipitation, water vapor, cloud liquid water, temperature profiles, supported by measurements of atmospheric electric field, raindrop size distribution, aerosols and other meteorological parameters. The microwave measurement systems include: (i) Multi-frequency microwave radiometer (ii) Micro rain radar (MRR) operating at 24.1, (iii) A Ku-band receiving system that monitors co-polar and cross-polar components of a plane polarized signal. The major studies undertaken on convective process are: (i) short-term prediction of convective rain, (ii) roles of atmospheric water vapour and cloud liquid water content in initiating the convective processes, (iii) signatures of atmospheric electric field in identifying the convective clouds, (iv) signatures in temperature profiles in the boundary layer during convective processes (v) effects of strong convective precipitation in causing significant Ku-band propagation effects over earth-space paths.

The present talk will cover Sir J C Bose’s early contributions in developing microwaves components and systems. In the next part of the talk, the present activities on microwave probing of tropical atmosphere at the University of Calcutta, Kolkata, will be presented which have important implications in climate studies and satellite communications in the tropical region.

講演終了後、懇談会を予定しております。

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