Title: 3D Numerical Ray tracing of Radio wave propagation through Ionosphere.

Presented by: Ankita Manjrekar

Abstract-

The ionosphere is a region of the earth's upper atmosphere where neutral air is ionized by solar photons and cosmic rays. HF radio waves travelling through ionosphere interact with the free electrons present there and are bent back towards the surface of earth. Due to these reflections from ionosphere the radio signals are able to travel longer distances. Although today, satellites are widely used, HF radio communications using the ionosphere still play a major role in providing worldwide radio coverage. But ionosphere is continuously changing medium and predicting how radio signals may propagate in such medium is still a difficult task. Hence ray tracing in ionosphere is of great interest to a variety of radio communications users. It is also useful in military, aid agencies, remote communication and in Over the Horizon radars. We have developed a ray tracing simulation using ANNIM model to predict background ionosphere. Using this ray tracing simulation we aim to predict the real height curve of ionosphere using the virtual height curve of the ionogram.

References-

[1] Fontell, Mathias. Numerical Ray Tracing of Medium and High Frequency Radio Waves in the Terrestrial Ionosphere. Diss. University of Oulu, 2018.