Title: Principles of Ionospheric Radars

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Abstract:

Radar is an electromagnetic remote sensor used to detect and measure the range of the desired targets, such as aircraft, ships, spacecraft and even the natural environment. It sends a signal and the range of the object is measured using the echo which is received back. This system is based on the radar equation that is a very useful guide to design a radar. Using the radar equation, we can adjust the received power of echo signal which varies depending on whether it is single or distributed target.
Different types of Radars can be used to probe our ionosphere to get its characteristics, by employing various scattering mechanisms. The important two ionospheric radars are coherent and incoherent backscatter radar techniques. To study the generation of different ionospheric irregularities we can use these radars to probe the ionosphere. In my talk I will be discussing the above-mentioned concepts which will be immensely helpful in designing our own radar system for studying the ionospheric irregularities.

References:

[1]. Atmospheric Radar: Application and Science of MST Radars in the Earth's Mesosphere, Stratosphere, Troposphere, and Weakly Ionized Region by Wayne K. Hocking et al.
[2]. Radio Techniques for Probing the Terrestrial Ionosphere by R. D. Hunsucker.
[3]. Introduction to Radar systems by Merrill I. Skolnik (3rd edition)