

Study of Radio wave propagation through various layers of Earth's Atmosphere

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Abstract:

Radio wave propagation is the backbone of the modern communication system. Understanding the fundamentals of radio wave propagation and studying the existing models of wave propagation through the atmospheric layers will make way for newer better models. In this talk I'll present the overview of different modes of propagation of radio waves, specifically Ground wave and Sky wave radio propagation through atmosphere. We'll have a look on the existing model of HF radio wave propagation through ionosphere and then following the similar footsteps will create a simulator for Troposphere where tropospheric wave propagation characteristics is studied. For this purpose, the classical Hamiltonian approach and RK4 method for computing the ray trajectory is utilized. On the other hand, the phenomenon of signal attenuation due to Earth's conductivity will be studied for Ground wave using Norton's theory of ground wave propagation. Combining the knowledge of both the modes of wave propagation will enhance the reliability of Communication systems/devices.