



## **0.1 Modelling of ionospheric scintillation observed at low latitude**

### **0.1.1 A. K. Singh, K. Patel, S. Prasad, and R. P. Singh**

Atmospheric Research Lab., Department of Physics, Banaras Hindu University,  
Varanasi-221005, India (abhay\_s@rediffmail.com)

The F-region of the ionosphere is a fascinating part of the upper atmosphere having both academic and applied interest. The presence and movement of plasma density fluctuations in this region are studied by monitoring phase, frequency and amplitude of radio waves propagating through this region. At Varanasi, we have recorded amplitude fluctuations of VHF waves (frequency 250 MHz) and studied various features of plasma density fluctuations also called as ionospheric irregularities. In the estimation of parameters, we have used the theory of weak scattering.

In this paper, we have used weak scattering theory and assumed the plasma density fluctuations to behave like phase changing screen model. Appropriate relations for scintillation index  $S_4$ , and phase variance,  $\Phi$  are derived and computed for different parameters of the plasma density irregularities of the ionosphere. The plasma turbulence  $C_s$  has been defined and computed for different values of plasma density fluctuations. It is observed that the scintillation index  $S_4$  and phase variance  $\Phi$  depends on the strength of the plasma turbulence and increases with its increase. Finally the results obtained from simulation/modelling are compared and discussed with the available recent results.