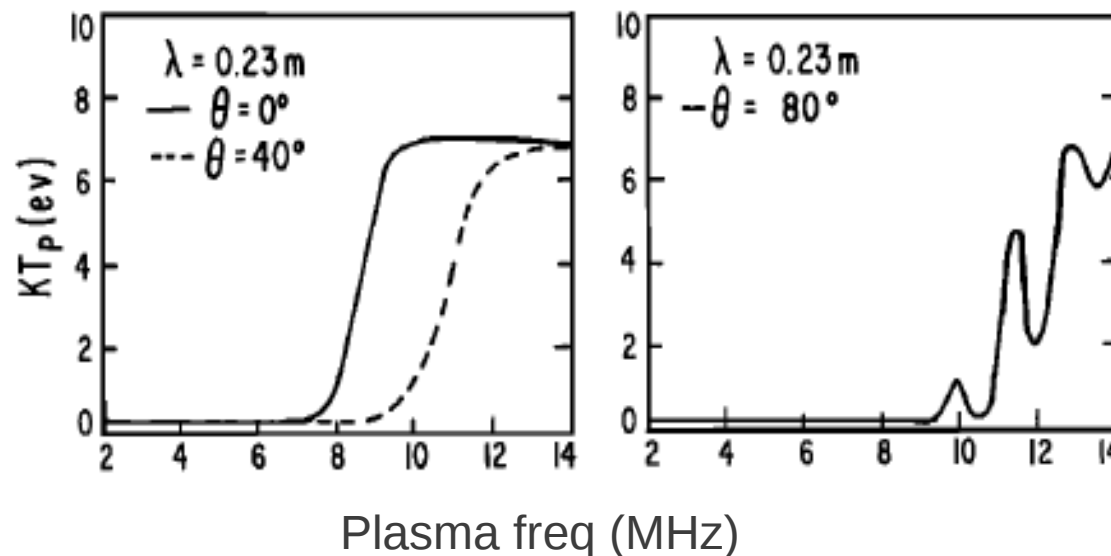


# Night-time F-region Plasma lines at Sondrestrom, Greenland

Asti Bhatt & Anja Stromme (SRI International)

F-region plasma lines at  $\lambda = 0.23\text{m}$  (Sondrestrom radar) are extremely weak at lower electron density values.

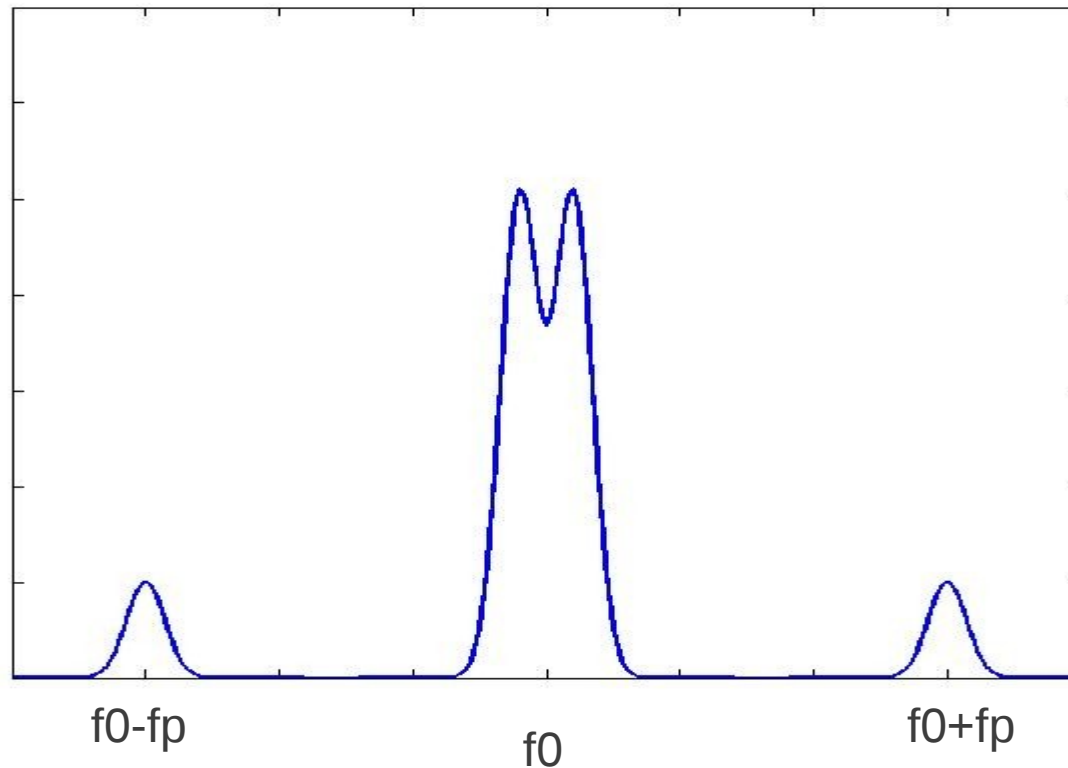


[Yngvesson & Perkins (1968)]

Ne in the range of  
 $\sim 1$  to  $4 \times 10^{11} / \text{m}^3$   
for  $f_p \sim 2\text{-}6$  MHz

What causes these resonance lines to be detected ?

# Plasma lines

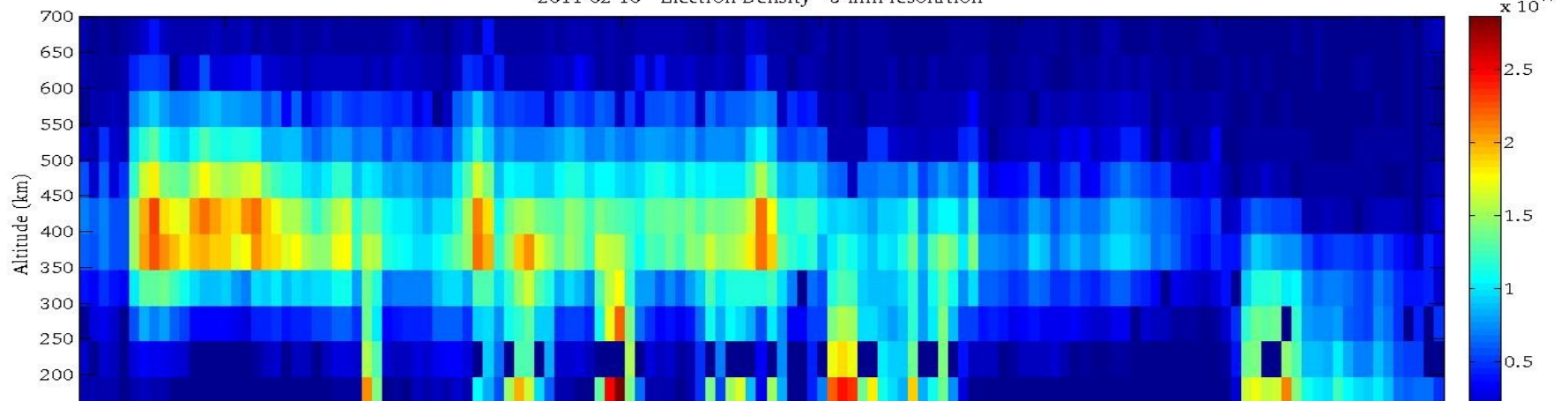


Plasma lines are a pair of resonance lines in the incoherent scatter spectrum occurring at the offset of (approximately) plasma frequency from the transmit frequency.

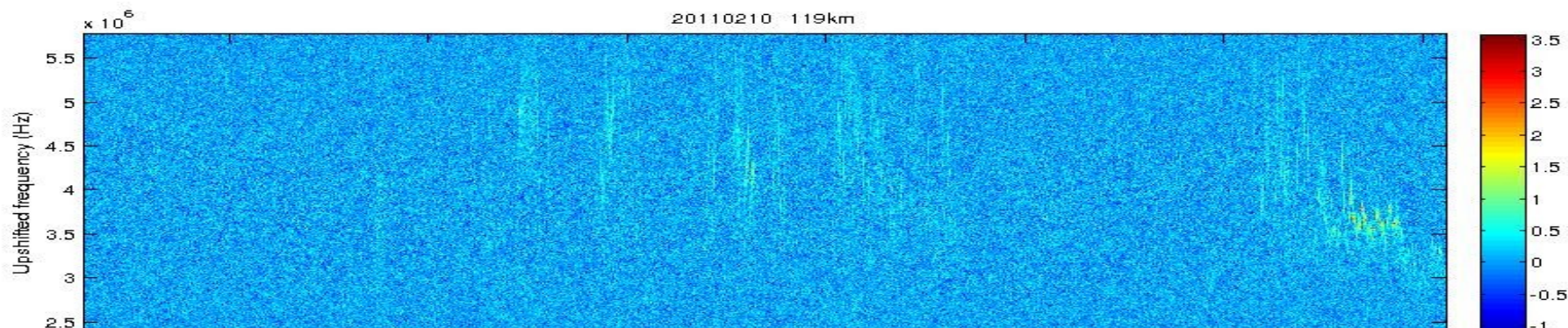
Plasma line enhancement is typically a result of non-maxwellian tail caused by non-thermal electrons

$$\omega^2 = \omega_{pe}^2 + \frac{3}{2}k^2 v_{th}^2 + \Omega_e^2 \sin^2 \alpha.$$

Ne  
/m<sup>3</sup>



Auroral  
Plasma  
line



F-region  
Plasma  
line

