







Solar Maximum:

Sun Spot Number = 200

Hence average foF2 = 4.4 SQRT(1. +0.02\*200) = 9.839 MHz

$$nmF2 = 1.24 * 10^{**4} * 9.839^{**2} = 1.20 * 10^{**6} \text{ (cm}^{**3}\text{)}$$

7. A horizontal neutral wind in the upper thermosphere can drive plasma either upwards or downwards because the electrons and ions are bound to magnetic field lines even although the flowing neutral gas is colliding with the plasma. How large is the vertical induced plasma drift if an equatorward, meridional, neutral wind of 50 m/s is present at a mid-latitude location where the local magnetic dip angle is 45°.

$$\text{Induced vertical drift} = 50 * \cos(45) * \sin(45) = 25.00 \text{ m/s}$$

8. At the same mid-latitude location an eastward electric field leads to a vertical drift. Calculate this induced drift if the eastward electric field has a magnitude of 15 mV/m.

$$\text{Magnitude of E} = 15 * 10^{**3} \text{ V/m}$$

$$\text{Magnitude of B} = 0.45 * 10^{**4} \text{ T (this is an estimate!)}$$

$$V = E/B = 15 * 10^{**3} / 0.45 * 10^{**4} = 333.3 \text{ m/s}$$

$$\text{Vertical component is } \text{vertV} = V * \sin(45) = 235.7 \text{ m/s}$$

9. The diagram shows three ionospheric electron density profiles. Determine the total electron content (TEC) for each profile. Calculate the slab thickness for each profile.

Profile c estimated TEC = 12. Tecu, and nmF2 = 8 \* 10^{\*\*5} (cm^{\*\*3}), slab thickness = 140 km.

