

國立中央大學99學年度碩士班考試入學試題卷

所別：太空科學研究所碩士班 不分組(一般生) 科目：電離層物理 共 / 頁 第 / 頁

本科考試禁用計算器

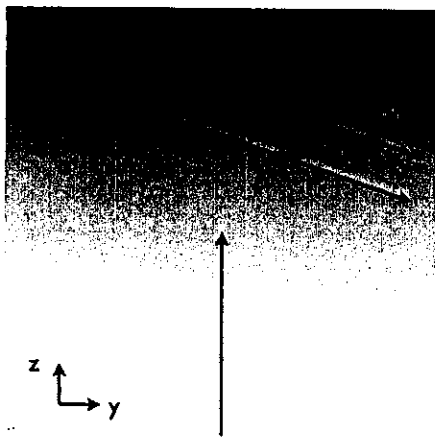
*請在試卷答案卷(卡)內作答

(1, 20%) Derive the pressure profiles (vs. height from ground to 1,000 km altitude) of isothermal neutral atmosphere for different species (N_2 , O, and H) under hydrostatic equilibrium and their relations with scale heights.

(2, 20%) Explain why the nighttime plasma will disappear in the E-region but can sustain in the F-region. It is assumed no solar radiation during the night.

(3, 20%) Derive the dispersion relation (or phase refractive index) of radio wave propagating in a collision-less non-magnetized plasma. You can start it from Maxwell's equations and equation of motion for electrons.

(4, 20%) Sketch possible ray traces (group path) of O-wave and X-wave normal incident from a ground station into a collision-less stationary magnetized horizontal stratified ionosphere. It is assumed the wave frequency is less than f_oF_2 of the ionosphere.



(5, 20%) Explain how electric field components perpendicular to the magnetic field can be mapped for long distances along the geomagnetic field. For example, any electric field generated at ionospheric heights would be transmitted along the field lines to very high altitude.

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