HIGH RESOLUTION LY-α OBSERVATIONS OF COMET KOHOUTEK BY SKYLAB AND COPERNICUS

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ABSTRACT

The Ly-α emission line of Comet Kohoutek was observed with two high spectral resolution instruments yielding consistent results. The first set of measurements occurred on 5 dates from 19 December 1973 to 6 January 1974; these measurements were made with the Naval Research Laboratory's S082B spectrograph from the Skylab Apollo Telescope Mount. The second set of measurements occurred on 29 January and 2 February 1974; these measurements were made with the Princeton telescope-spectrometer on the Copernicus satellite (Orbiting Astronomical Observatory - C). Both measurements were made with the instruments pointed at the cometary nucleus. The FWHM (full width at half maximum) of the emission line profiles so obtained exceeded in all cases the instrumental profiles expected. The calculated Skylab instrumental profile FWHM is 0.055 Å at Ly-α while the Copernicus FWHM determined by geocoronal Ly-α observations is 0.068 Å. The residual FWHM due to the comet is 0.13 Å for the Skylab data and 0.063 Å for the Copernicus data. If these line widths are interpreted as Doppler velocity effects and if optical depth effects are considered, then both sets of data are consistent with a Doppler velocity of about 10 km/sec. The uncertainties in both the Skylab and Copernicus data correspond to Doppler velocities of the order of $\pm$3 km/sec.

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