

ORFEUS-SPAS II FUV Observations of Molecular Hydrogen in the Galactic Halo

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The far-ultraviolet spectra of HD219188, HD94473, and HD18100, three early-type stars in the Galactic halo, were obtained with the echelle spectrometer on the ORFEUS-II telescope in 1996 November. We derive H₂ column densities for the rotational levels up to $J=6$ and estimate excitation temperatures and H₂ dissociation rates for the cloud towards HD219188 and HD94473. The results indicate that strong radiation fields might exist near these clouds, but these radiation fields do not seem to act as major heating sources. No significant H₂ absorption is seen towards HD18100. The correlation between our H₂ column densities and published extinction maps confirm that the molecular clouds are associated with dust clouds that lie between the observed stars and the sun. We directly find a nominal lower limit of $X_{\text{CO}} \geq 2 \times 10^{19} \text{ cm}^{-2} (\text{K km s}^{-1})^{-1}$ on the conversion factor between $N(\text{H}_2)$ and $W(\text{CO})$ for the clouds in the line of sight to HD94473, which is consistent with previous estimates.