

Observations of Molecular Hydrogen in the Carina Nebula

Dae-Hee Lee¹, Mark Hurwitz², Kyoung-Wook Min^{1,3}

¹ Department of Physics, Korea Advanced Institute of Science and
Technology,

373-1, Kusong-dong, Yusong-gu, Taejon 305-701, Korea

² Space Sciences Laboratory, University of California, Berkeley,
CA94720-5030, USA

³ Satellite Technology Research Center, Korea Advanced Institute
of Science and Technology, 373-1, Kusong-dong, Yusong-gu,
Taejon 305-701, Korea

Observations of molecular hydrogen absorption lines in the continuum spectra of 3 early-type stars in the Carina Nebula, HD93129A, HD93250, and HD303308, were made with the Berkeley EUV/FUV spectrometer on the ORFEUS telescope in 1993 September. Using high-resolution optical observations of Na I absorption lines, with the constraint on the distribution and velocity of molecular clouds along each line of sight, we obtain column densities for each H₂ rotational level and derive excitation temperatures and UV radiation fields for the H₂ clouds towards each star. All three stars show strong H₂ absorption features, indicating that the Carina Nebula contains abundant hydrogen molecules. Also, the UV radiation field strength is found to be correlated with the distance between the target star and η Car. Based on these results, we examine the morphology of the Carina Nebula in association with the CO molecular clouds.