

Poster

Interstellar UV radiation field in high redshift galaxies probed by Damped Lyman Alpha systems: measurements based on excitation of H₂ rotational levels

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We have calculated a database of photon-dominated region models of the diffuse molecular cloud for the grid of physical conditions of the interstellar medium. We have developed a method for determination of the physical parameters of ISM, namely - gas density and intensity of the interstellar UV radiation field. The method is based on the comparison of the population of molecular hydrogen rotational levels calculated in our PDR database with values measured in clouds at high redshifts detected in quasar spectra. We found that H₂-bearing medium in strong H₂-bearing DLAs have typical values for the kinetic temperature, hydrogen density, and UV radiation field of, respectively, $T \approx 100$ K, $n \approx 100 \text{ cm}^{-3}$, and I_{UV} about twice the intensity of the Draine field.