Weak H_2 emission from diffuse and translucent clouds

W.F. Thi[1], E.F. van Dishoeck[1], D.J. Jansen[1], M. Spaans[2], and J.H. Black[3]

[1] Leiden Observatory
[2] Johns Hopkins University
[3] Onsala Space Observatory

Abstract

We present results from our searches for the pure rotational lines of H2 with the ISO-SWS from low-density molecular clouds exposed to ultraviolet radiation which is not much enhanced over the normal interstellar radiation field. Lines up to S(5) are detected from the IC 63 cloud illuminated by the B0.5 star γ Cas, which are compared with the detailed available physical models for this cloud (Jansen et al. 1995, A&A 302, 223). Results for the S(0) and/or S(1) lines will be presented for a variety of translucent clouds, ranging from 'cool' PDRs exposed to radiation from late B and A stars to the outskirts of molecular clouds and isolated translucent clouds. The data form stringent tests of the temperature structure and heating mechanisms of the cloud.