

## Observations of a nonstationary PDR

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We present imaging and spectroscopic observations of dust and gas emission from the western edge of the  $\rho$  Ophiuchi molecular cloud facing the B2 star HD 147889. This is a nearby PDR (PhotoDissociation-Region),  $d = 135 \pm 15$  pc from the star parallax, with an edge-on geometry where the observations allow to spatially resolve the region of penetration of the external UV light and  $H_2$  photo-dissociation. We have obtained a large body of observations on this PDR: ISOCAM images in the mid-IR emission, ISO-SWS pure rotational lines of  $H_2$ , image in the  $H_2$  1-0 S(1) line and CSO observations of CI and CO lines. The  $H_2$  rotational level populations provide a thermal probe which showing the presence of a gas with a temperature  $T_{gas} \sim 300$  K. The ratio of ortho- to para- $H_2$  is  $\sim 1$  significantly smaller than the equilibrium ratio of 3 expected in gas at that temperature. Moreover, the comparison of the observed emission profiles with a stationary PDR model points at the importance of advection. In fact, PDRs with moderate-to-strong photon flux have a rapidly propagating dissociation front which affects stratified structure as well as the line emission profile of the gas.

FIRST will give a new perspective on the dynamic of this region. For example, HIFI and PACS will provide unique observations of the  $[C^+]$   $158\mu\text{m}$  line characterised by high spectral and spatial resolutions.