NEAR-INFRARED SPECTROSCOPY OF NGC 253: STARBURST AND SURROUNDINGS

D.LUTZ AND F.PRADA
Max-Planck-Institut für extraterrestrische Physik
Postfach 1603, 85740 Garching, Germany

Near-infrared longslit spectra of NGC 253 obtained with IRSPEC at the ESO NTT are presented. By analysis of the ^{12}CO 2.29μm bandhead we find that the stellar population in the central starburst region ($r \sim 150$ pc) rotates more slowly than the gas, but has a velocity dispersion of 128 km/s, about twice the value found for emission lines from the gas in this region. This implies an about five times higher dynamical mass than previously derived (Rieke et al. 1980), removing the need to invoke a lower mass cutoff in the starburst initial mass function. The peak of near-infrared emission is displaced from the dynamical center.

We discuss extinction values derived from line ratios of [Fe II], H, and H_2. While part of the differences can be explained by the wavelength dependency of derived extinction in case of mixed emitters and absorbers, there are also significant differences between the extinction for H and H_2. This requires differences in local extinction and calls for caution in the interpretation of H vs. H_2 line ratios in other starburst galaxies.

Along the major axis of the galaxy, the H and [FeII] emission are similarly distributed and trace the starburst region of radius about 150 pc. The H_2 emission is more extended, reaching out to at least 300 pc. This halo of H_2 emission which can be interpreted in terms shocks, which would have to be slow to avoid excitation of [Fe II], or of a huge photon dominated region. The required properties of such a PDR - dense molecular clouds in a hot thin medium are consistent with properties inferred from Far-infrared observations (Carral et al. 1994). In none of the near-infrared lines do we find evidence for linesplits due to the NGC 253 superwind.

Carral,P., et al. 1994, *Astrophys. J.* **423**,223
Rieke,G.H., et al. 1980, *Astrophys. J.* **238**,40