Spectroscopy of IRAS 02091+6333

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We present a detailed spectroscopic investigation, spanning four winters, of the asymptotic giant branch star IRAS 02091+6333. Zijlstra & Weinberger (2002) found a giant wall of dust around this star and modelled this unique phenomenon. However their work suffered from the quality of the optical investigations of the central object. They could use only a single quick look spectrum and the original TYCHO $B_{\rm T}$ and $V_{\rm T}$ magnitudes to estimate the spectral type and the interstellar extinction towards the target.
Thus we obtained spectra and photometry at the Innsbruck 60 cm telescope (Kimeswenger 2001) of this unique object for several years to derive an accurate spectral type and the foreground extinction. This allowed us to determine more precisely the distance to the target which is important for the modelling of the dust shell found on IRAS images. Zijlstra & Weinberger (2002) outline such shells for various types of objects at late stages of their evolution. Their focus was especially on a swept up shell with a void in the interstellar matter around the target. This is crucial for both, the "Swiss cheese" like structure of the interstellar material and for the hydrodynamic evolution of the planetary nebula built after the current evolutionary stage.
The measurements presented here suggest a weak irregular photometric variability of the target, while there is no evidence of a spectroscopic variability over the last four years.

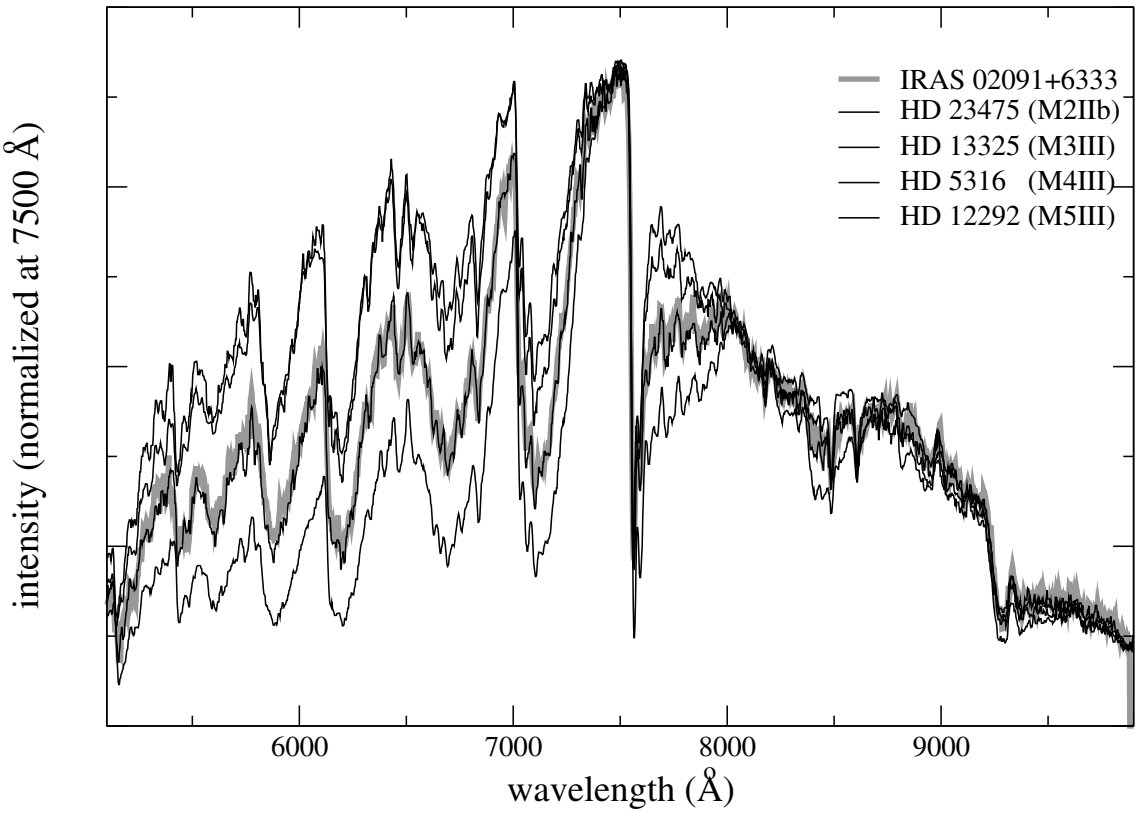

Fig. P 56. The composite spectrum of IRAS 02091+6333 (bold line) using an interstellar extinction $E_{B-V} = 0\overset{\rm m}{.}43$ overlaid with (from top to bottom) the spectra of HD 23475 (M2IIb), HD 13325 (M3III), HD 5316 (M4III) and HD 12292 (M5III). The spectrum of HD 5316 is almost exactly superimposed with that of the target.

References:

Kimeswenger, S. 2001, AG Abstract Series 18, 251
Zijlstra, A., & Weinberger, R. 2002, ApJ 572, 1006