DISTRIBUTION OF THE 3.1 μm FEATURE IN CEPHEUS A

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Near-infrared absorption features produced by core-mantle dust grains are observed in the line of sigth of many protostellar objects. Most of the observations have been made with relatively large beams, around 10". Very often, however, extended structures are associated with the young objects. Since the absorptions are formed under different physical and chemical conditions, the large beam observations might be providing a somehow inexact information on aspects like spatial distribution of the features, where and how they are built up, optical depths, etc. It seems, therefore, that high spatial resolution observations, $\theta \leq 3$", could be helpful to monitor the expected changes of the features.

Cep A/IRS 6 is a suitable candidate to carry out such a kind of study. This source is located in an active star formation region and consists of a young object associated with an extended reflection nebula. Rapid changes in the extinction across the object and a deep 3.1 μm ice feature (12" beam) are observed (Lenzen et al., 1984).

We have observed the ice feature in four positions of Cep A/IRS 6 with a 2".7 aperture. The observations have been carried out at the IRTF using the cooled grating array spectrometer, CGAS (Tokunaga et al., 1987). As an example of our results Figure 1 shows the 2.4 - 3.8 μm spectra of two positions. Position (0",0") is the maximum of the reflection nebula, and Position (-6",-8") is located at a position close to the suspected energy source where a molecular disk causes a rapid increase in the extinction (Lenzen et al., 1984). We see noticeable changes in the infrared continuum and in the 3.1 μm ice optical depth. The spectra also show some small but qualitative differences in the band shape. At Position (-6",-8") a shoulder at about 3.4 μm in the long wavelength wing of the ice feature is fairly present. In contrast, the shoulder is either not present or very weak at Position (0",0"). More details are given in a paper submitted to Astrophysical Journal.

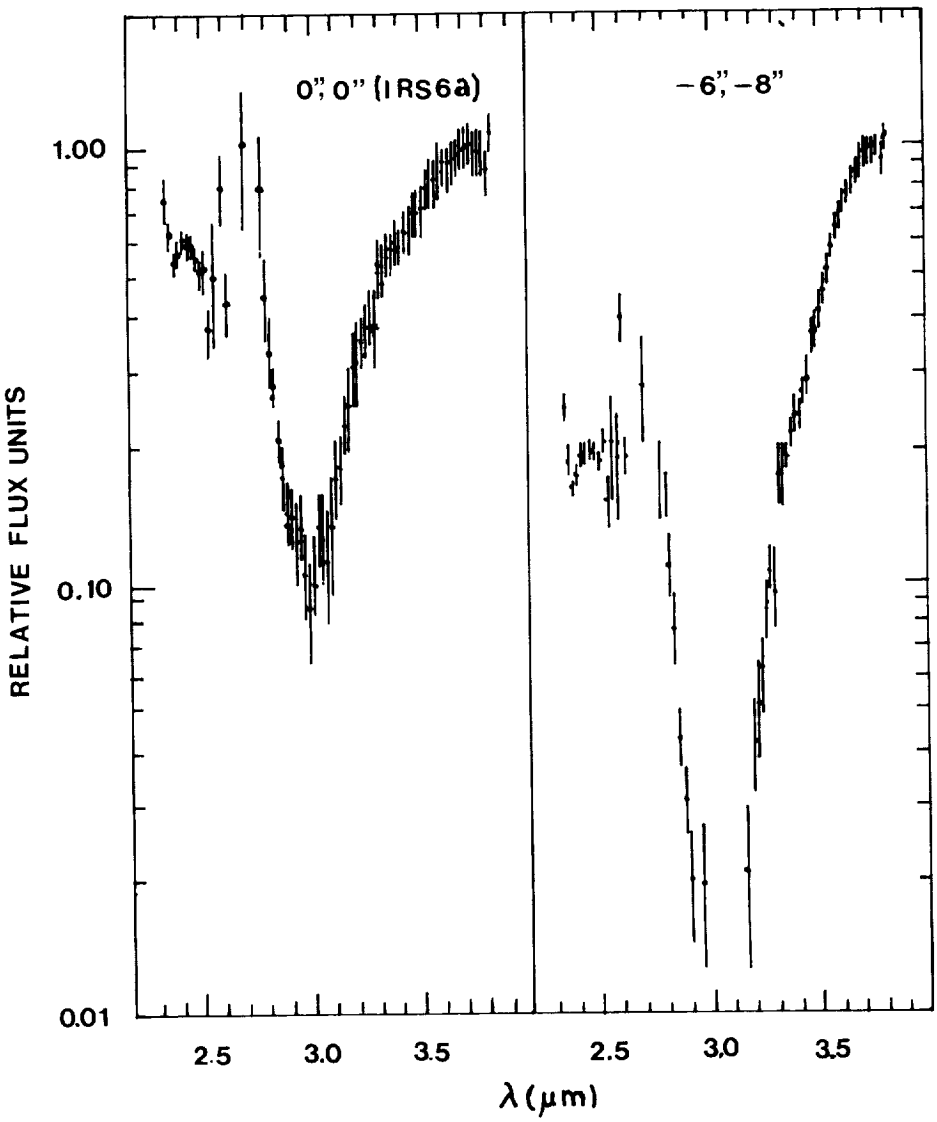

Figure 1: 2.4 - 3.8 μm spectra of two positions in Cep A/IRS 6 in relative flux units. Error bars include all kinds of uncertainties in the object and standard star observations.

REFERENCES

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