MULTI-COLOR INTERFEROMETRIC OBSERVATIONS OF MIRA STARS

Probing the Extended Atmosphere Structure and Chemistry

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Keywords: Miras atmosphere, infrared interferometry

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Nine bright O-rich Miras have been observed with IOTA in both K' and L' broad-band filters, in most cases at variability phases differing by less than 0.1. These results synthesize two observing campaigns carried out in February/March 2000, and then in October/November 2000. Surprisingly all Miras showed strong increases (from 20% to 100%) in measured unifrom disk diameters between the K' and L' bands (Mennesson et al. 2002, Changon et al. 2002). This apparent enlargement with wavelength is far more important than what can be accounted for by conventional differential limb darkening between the 2 bands.

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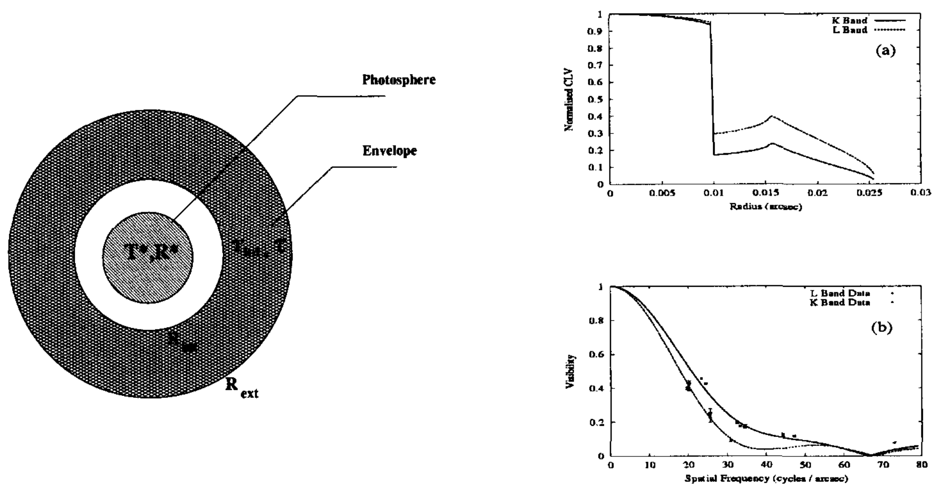
Figure 2 shows as an example the best fit obtained to R Leonis K' and L' visibility measurements using this simple 2-layer model, and a 1-D radiative transfer equation, solved for each line of sight. Central photosphere is considered as a blackbody with temperature T^*, radius R^*. To keep the model simple, temperature inside the envelope is assumed to decrease as $r^{-0.5}$, and density goes as r^{-2} (mass flux conservation).



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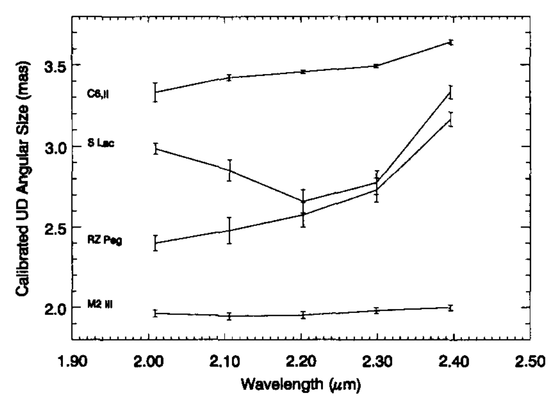

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microns) bands. We interpreted the observed diameter shift as a continuum or pseudo-continuum effect, and suggested that a very extended ($\simeq$ 3 stellar photospheric radii) semi-transparent gas layer was responsible for it, as its contribution to the overall flux increases with IR wavelength.

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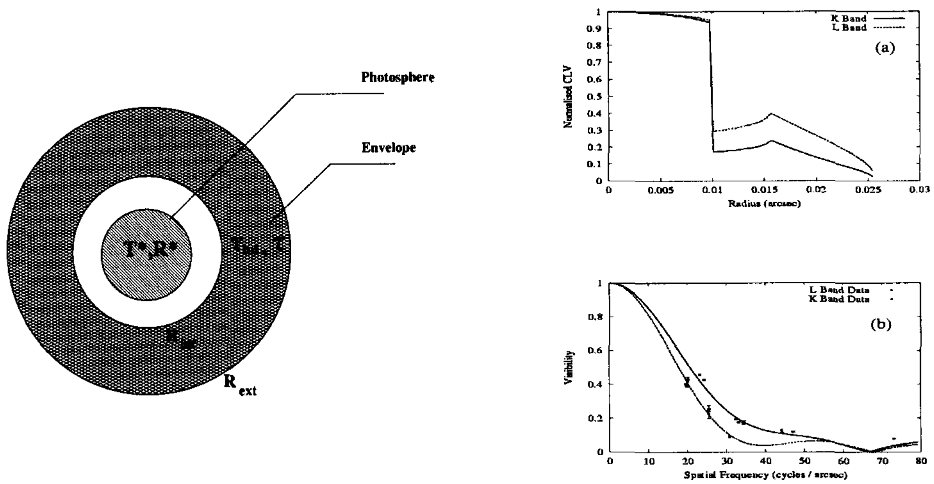

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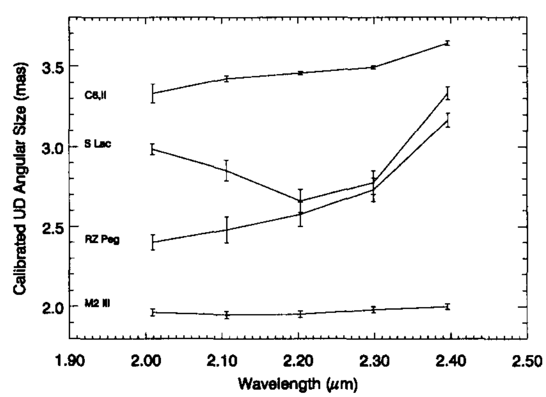

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