THE MOLECULAR ENVOLOPE OF MIRA

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We have mapped the CO $J = 2 \rightarrow 1$ and $J = 1 \rightarrow 0$ emission of the circumstellar envelope of Mira. Emission in both transitions extends to a distance of $\sim 4 \times 10^{16}$cm from the star. In the inner 2×10^{16}cm the lines show the presence of three velocity components. The main component has the intermediate velocity and extends over the whole envelope. From this component we have estimated a mass loss rate of $3 \times 10^{-7}\ M_{\odot} yr^{-1}$ and a total molecular mass of $1.2 \times 10^{-3}\ M_{\odot}$. We have shown that, from our data, the only reliable explanation for the lowest and highest velocity components is that they are due to an outflow located within the envelope.

NARROWBAND PHOTOMETRY OF PHOTOMETRICALLY PECULIAR OBJECTS

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This work is based upon $\alpha(16)\Lambda(9)$-photometry for 2 Planets, 11 Wolf-Rayet stars and 7 Planetary Nebulae. The results show anomalous $\alpha(16)$ *and* $\Lambda(9)$-indices for these objects. Thus, they are photometrically peculiar in this system. The main results are:

1) Callisto, Jupiter IV, shows $\alpha(16)$ and $\Lambda(9)$-indices which can be considered as excellent representatives of solar type stars (G2 V).

2) Uranus and Neptune have anomalous $\Lambda(9)$-index, because of a spectral feature in absorption around λ 7805 Å, most likely due to a carbon compound. Thus, they are off the main sequence in the $\alpha(16)\Lambda(9)$-array.

3) The Hα-line is possibly stronger in Uranus (marginal) and Neptune than in the Sun.

4) Wolf-Rayet stars have anomalous $\alpha(16)$-index, because of an extremely wide He II-line (λ 6560 Å), lack of hydrogen and the presence of spectral emission features that fall in the continuum used to determine this index.

5) Most WC stars have anomalous $\Lambda(9)$-index, because the presence of spectral emission features in the short wavelength continuum that defines this index.

6) Some W-R stars show variations in the strength of He II-line (λ 6560 Å).

7) Most WC stars are separated from WN stars in the $\alpha(16)\Lambda(9)$-array.

8) Planetary Nebulae have anomalous $\alpha(16)$-index, because the continuum around the hydrogen line is probably contaminated by [N II]-lines at λ 6548 Å and λ 6583 Å.

9) Planetary Nebulae have anomalous $\Lambda(9)$-index, because the short wavelength continuum is heavily contaminated by the [Ar III]-line at λ 7751 Å.

10) Planetary Nebulae lie far apart from all kind of stellar objects in the $\alpha(16)\Lambda(9)$-diagram.

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