SYNTHETIC SPECTRA FOR CARBON STARS FROM DYNAMICAL MODEL ATMOSPHERES

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1. Models

We used the two dynamic models **R7OS14** (Höfner et al., this volume) and **R7OS12** and four MARCS models (cf. Jørgensen et al. 1992). Model R7OS12 is similar to model R7OS14, only the C/O ratio is 1.2 in this model. The parameters of the MARCS models **M292814** and **M292812** are as follows: T_{eff} = 2928 K, log(g) = 0.3, [C]/[O] = 1.40 and [C]/[O] = 1.20 and for **M264614** and **M264612:** T_{eff} = 2646 K, log(g) = 0.5, [C]/[O] = 1.40 and [C]/[O] = 1.20.

2. Synthetic Spectra

We have computed opacity sampling spectra including the molecules CO, CH, C_2, CN, HCN, C_2H_2 and C_3. In Fig. 1 we compare IR spectra for maximum and minimum light of the dynamic models R7OS14 and R7OS12 in the left panel and of M292814, M292812, M264614 and M264612 in the right panel. The C/O ratio has only a weak influence, especially at wavelengths shorter than 4 m. In both dynamic models the IR features are strongest around minimum light and weakest around maximum light and phase shifts exist between different wavelength ranges. The variations are smaller in R7OS12 than in R7OS14.

3. Synthetic Colours

We computed synthetic J, H, K and L colours in the SAAO system and compared them with observations of R Scl kindly provided by P. Whitelock (Fig. 2). The observed IR colours and their variations as well as ISO-SWS spectra of R Scl (Hron et al., this volume) can be reproduced qualitatively.

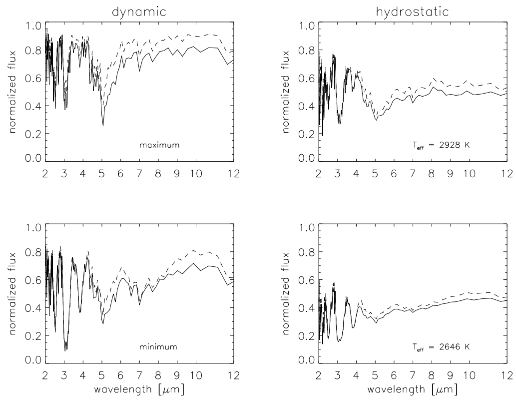

Figure 1. Synthetic opacity sampling spectra for maximum and minimum light for model R7OS14 (full) and R7OS12 (dashed) and for M292814, M292812 (dashed), M264614 and M264612 (dashed).

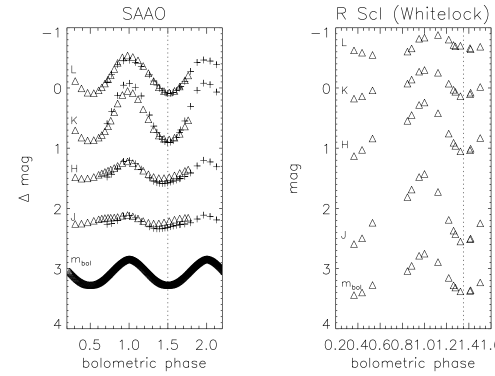

Figure 2. Resulting light curves for J, H, K and L in the SAAO system (left) for models R7OS14 (triangles) and R7OS12 (crosses) and observations of R Scl (right).

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The complete poster can be found on:
http://www.ast.univie.ac.at/~fzi/AGB/rita/science.html

References

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