

Comparison of Blanketing in a 3000 K, Oxygen Rich, Spherically Symmetric Model with the Blanketing in Non-Mira, M Giant Stars

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A flux curve has been computed using a preliminary, spherically symmetric model for a 3000 K, oxygen rich, giant star. The model was computed using the opacity sampling method with an improved frequency set, improved molecular equilibrium data and an improved set of opacities. In addition, a continuum flux curve is computed using the same model and only continuum opacity sources. The relative and to some extent the absolute blanketing used to compute both the model and the flux curve derived from the model may be illustrated by dividing the normal flux curve by the continuum flux curve. This same procedure is used to illustrate the blanketing in an observed star by dividing the observed flux curve by the continuum flux curve. When this is done, the blanketing in an observed flux curve may be compared with the blanketing in a model. When this comparison is made, it is obvious that the treatment of blanketing in the "new" flux curve, computed using the spherically symmetric model and using new parameters, is superior to the flux curves based on earlier models. This is especially true in the regions of the fundamental, the first overtone and the second overtone of CO. Also, the new water vapor opacity is much improved. The new water vapor opacity is based on actual measurements of high temperature water vapor. Correct representation of water vapor opacity is extremely important for oxygen rich stars because it forms a pseudo continuum because of its many lines. The TiO opacity does not fit the observations well. When the spherically symmetrical model flux curve is compared directly to an observed flux curve, the new flux curve gives a better fit than do flux curves computed from previous models. There is still (at least for the non-Mira stars) a serious flux excess in the model flux curves at 1.6 microns in the region of the H minus b-f and f-f crossover. However, this excess is not as great for the spherically symmetric model as it is for earlier plane parallel models. It is not determined if this improvement is due to spherical symmetry or due to the new model parameters.