Confrontation of the ISO spectra with model atmospheres of M-type stars: dwarfs, giants, and supergiants

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Abstract

The ISO spectra provide unique opportunity not only to test the model atmospheres of cool stars but also to explore new problems on the atmospheric structure of cool stars. First, we hope to clarify what can be understood by the present model atmospheres, which can now be regarded as well developed within the framework of the classical theory. Especially, recent release of the extensive spectral line database such as HITEMP is quite timely in exploring the full details of the ISO spectra by means of the model atmospheres. We also hope to clarify the luminosity effects in the infrared spectra of cool stars by our observations of dwarfs, giants, and supergiants with the ISO, and to calibrate these spectra in terms of the basic stellar parameters by the use of our grids of models that cover a wide range of temperature and luminosity. However, we already found that the classical photospheric models are not sufficient to understand full details of the ISO spectra, even in the near IR, and more unified understanding of the outer atmosphere should be needed for this purpose.