Putting Radiation Hydrodynamics into a Detailed Model Atmosphere Calculation

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Non-grey hydrodynamics is still clearly not practicle. However, it is possible to combine a grey radiation hydrodynamics code and a non-grey model atmosphere code to obtain more realistic results. In this presentation we describe our current work in combining the atmosphere code PHOENIX and the radiation hydrodynaimcs code TITAN. We use PHOENIX to tabulate the material functions like the equation of state and the mean opacities. For example, TITAN can then calculate a shock propagating through an atmosphere for which the initial structure is provided by PHOENIX. The resulting atmospheric structures will then be fed back into PHOENIX to calculate high resolution spectra including NLTE treatment. Our goal is to apply this method to obtain high quality spectra of Mira variables as a function of phase.