

Computer models for a cool star in the vicinity of a hot subdwarf

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Synthetic spectra from model atmospheres are frequently used in the analysis of observed spectroscopic and photometric data. For the most part, the models are sufficiently detailed to test the current theoretical understanding of stellar and sub-stellar mass objects at various stages in their evolution. However, the vast majority of model atmospheres are constructed under the assumption that the nearest stellar neighbor is so far away that it can be safely ignored. This assumption, while safe for most stars, fails for many short period binaries. A number of binary systems have orbital separations small enough so that one of the binary members is significantly heated by its companion. In order for synthetic spectra to be useful in such cases, the standard “isolated” modeling approach must be replaced by one that includes the effects of irradiation.

The AADor system is an excellent example of a well-studied close binary system. Its members are a hot subdwarf and an extremely low mass cool companion. I will present you how several PHOENIX/1D models combined to a 1.5D model can represent this system and compare these results to a PHOENIX/3D model that is able to include 3D effects like transverse radiation and transmission of light close to the terminator.

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