

Theoretical Spectra of the Am CVn Binary System SDSS J0926+3624 : Effects of Irradiation onto the Donor Stars

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Taking into account a range of parameters determined from the evolutionary models and available observational data, the detailed non-LTE spectra for the primary star and the irradiated donor star in the only known eclipsing AM CVn system to date SDSS J0926+3624 are constructed based on the TLUSTY stellar atmosphere code. The combined spectrum of the primary and the donor stars along with a multi-color blackbody spectrum of the accretion disk that reproduces a detailed numerical model is compared to the SDSS optical spectrum of the system. The photometric flux of the primary star inferred from eclipse observations is compared with the synthetic spectrum. The model fit of the two independent observations provides an upper limit on the distance of the system for different effective temperatures of the primary. In addition, an upper limit on the combined flux of the disk and the donor in the infrared region wherein the contribution of the primary is negligible is also determined. It is shown that the spectrum of a sufficiently cool donor can exhibit emission lines due to irradiation from a hot primary and the emission features should be detectable in the infrared even though the contribution of the flux from the disk dominates. Thus, it is pointed out that infrared observations of the system would provide important information on the thermal state of the donor as well as useful insight on the thermal properties of the primary star and the accretion disk.

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