DUST ENVELOPES AND IR EXCESSES IN A SAMPLE OF RS CVn-TYPE BINARIES

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In recent years, we have been studying the energy distribution of RS CVn binaries from UV to far IR wave lengths, in order to derive general properties of the systems and to better understand their evolutionary scenario, including the history of mass loss (Busso et al., 1987, 1988). In this framework, we have so far analyzed, at different level of accuracy, a total of about 60 sources, among which 30 have been the object of detailed studies, on the basis of broad band photomertic observations from 0.35 to 60 μm, using ground-based telescopes (mainly at La Silla, ESO) and IRAS-PSC information. For these 30 binaries, the quasi-periodic variations due to the presence of photospheric spots have been carefully subtracted, to derive the energy distributions of the *unperturbed* systems.

For each source, we have then compared our data to the emission expected by combinations of two normal stars in the range A0 - M0, allowing the spectral types to vary until the best fit is obtained; in this way, the possible error due to uncertainties in the original classification is suppressed. In 40 % of the cases (12 sources out of 30) we have found that no combination of stellar spectra can account for the whole distribution of colours, from U to 60 μm; remarkable IR (and sometimes UV) excesses exist, far too large to be attributed to observational or systematic errors. Moreover, the distribution in wave length of the excess emission is typical of the hot dust often observed around evolved stars.

By means of a simple model for the absorption and thermal emission of the dust, and assuming for dust particles the optical characteristics given by Jones and Merril (1975), we succeeded in reproducing very well the energy distribution of the 12 sources with detected excess. Typically, very thin ($\tau_{10\mu m} \simeq 0.002$ - 0.01) and rather hot ($T_{dust} \simeq 1500$ - 2500 K) dust shells are found. Since some of our sources have mass loss rates in rough agreement with the empirical relation given by Reimers (1988), we are now studying the possible interpretation of our findings in terms of mass loss phenomena either on the main sequence or during the evolution to the giant branch.

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