



Dust around R Coronae Borealis stars: I. Spitzer/IRS observations

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Spitzer/IRS spectra from 5 to 37 μm for a complete sample of 31 R Coronae Borealis stars (RCBs) are presented. These spectra are combined with optical and near-infrared photometry of each RCB at maximum light to compile a spectral energy distribution (SED). The SEDs are fitted with blackbody flux distributions and estimates made of the ratio of the infrared flux from circumstellar dust to the flux emitted by the star. Comparisons for 29 of the 31 stars are made with the IRAS fluxes from three decades earlier: Spitzer and IRAS fluxes at 12 μm and 25 μm are essentially equal for all but a minority of the sample. For this minority, the IRAS to Spitzer flux ratio exceeds a factor of three. The outliers are suggested to be stars where formation of a dust cloud or dust puff is a rare event. A single puff ejected prior to the IRAS observations may have been reobserved by Spitzer as a cooler puff at a greater distance from the RCB. RCBs which experience more frequent optical declines have, in general, a circumstellar environment containing puffs subtending a larger solid angle at the star and a quasi-constant infrared flux. Yet, the estimated subtended solid angles and the blackbody temperatures of the dust show a systematic evolution to lower solid angles and cooler temperatures in the interval between IRAS and Spitzer. Dust emission by these RCBs and those in the LMC is similar in terms of total 24 μm luminosity and [8.0]-[24.0] color index.

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