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# Circumstellar dust and influence of the hot component in symbiotic Miras

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## Abstract

Circumstellar dust in symbiotic Miras plays a key role in driving stellar outflow and mass transfer that can lead to nova outbursts. We have studied dust properties and mass loss rates in 14 symbiotic Miras, including five symbiotic novae, by use of long-term near-IR photometry, ISO spectra and interferometry. DUSTY code was applied to solve radiative transfer through dust. The results show that all dust envelopes in symbiotic Miras have similar properties, with varying optical depth. Symbiotic Miras that underwent nova outburst generally show thicker and larger dust envelopes, higher mass loss, dust obscuration events and formation of larger dust grains than ordinary symbiotic Miras. Long-term brightness variations were detected in at least four symbiotic Miras which cannot be attributed to orbital motion. Generally, symbiotic Miras prefer to form dust at higher temperatures and of larger grain sizes nearer to the star than single Miras. Influence of hot component on dust was also studied by use of CLOUDY code. We have showed that high-density gas region formed due to colliding stellar winds can provide shielding of dust from the strong UV flux of the hot companion.

**Keywords:** binaries: symbiotic, circumstellar matter, radiative transfer, stars: AGB and post, AGB, infrared: stars

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