

# Binary Red Supergiants: A New Method for Detecting B-type Companions

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With the exception of a few well-known and studied systems, the binary population of red supergiants (RSGs) remains relatively uncharacterized. Famous systems such as VV Cep, 31 Cyg and zeta Aur contain RSG + B star binaries and here we explore whether B stars are the main type of companion we expect from an evolutionary point of view. Using the Geneva evolutionary models we find that this is indeed the case. However, few such systems are known, and we use model spectra to determine how easy such binaries would be to detect observationally. We find that it should be quite difficult to hide a B-type companion given a reasonable signal-to-noise in the optical / blue portion of the spectrum. We next examine spectra of Magellanic Cloud RSGs and newly acquired spectra of Galactic RSGs looking for new systems and refining our conclusions about what types of stars could be hidden in the spectra. Finally, we develop a set of photometric criteria that can help select likely binaries in the future without the overhead of large periodic or spectroscopic surveys.

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Comments:

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