

CARMENES. Multiplicity of M dwarfs from tenths of arcseconds to hundreds of arcminutes

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Abstract

With the help of CARMENCITA, the CARMENES Cool dwarf Information and data Archive, we investigate the multiplicity of M dwarfs in the solar neighbourhood observable from Calar Alto to prepare and characterize the final sample of stars of CARMENES. Our multiplicity study covers a wide range in projected physical separations, from 0.5 to 50 000 au. The inner range is covered with a lucky-imaging survey of 385 M dwarfs with FastCam at the 1.5 m Telescopio Carlos Sánchez (42.3 mas/pix), complemented with a literature search. We explore visual or physical companions from 0.15 to 18 arcsec around our targets. These observations are important to discard very close companions that may induce spurious variations in the radial velocity of the primary and mimic the presence of planets. The outer range is covered with a detailed analysis of Washington Double Stars catalogue data and optical images taken by us with TCP and CAMELOT at the 0.8 m IAC80 telescope, and an astrometric study of all-sky public images and catalogues. We review the main results of our searches and derive the multiplicity of M dwarfs at close and wide physical separations.