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# Characterizing the M dwarf planet population with CARMENES

CARMENES is a large RV-survey for low-mass planets of M-stars. In contrast to other M-star surveys its main focus are M3-M4V stars.

One of its aims is to determine the frequency of planets with periods of less than 50 days. Although the survey is still on-going, we have started to develop a method to determine the detection limits for each star. The basic idea is to simulate the RV-signal of all possible planets and then to calculate which of these would have been detected using the times and the accuracy of the RV-measurements obtained with CARMENES. In a first step we use only those stars for which 50 RV-measurements have already been obtained with CARMENES where no planets have been detected. We discuss the influence of eccentricity of the orbits, the multiplicity and the accuracy of the measurements on the detection limit.

In a second step, we will use those results for planet population synthesis. We will simulate the CARMENES survey observing a synthetic planet population produced by a global planet formation and evolution model. Using actual CARMENES measurements, we can determine which planets would not be detected and apply the resulting bias. The remaining subpopulation of detectable planets can be compared with the observed sample to constrain formation theories and make predictions about yet to be detected planets.

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