

Modelling activity-induced radial velocities through STELLA/WiFSIP simultaneous photometry.

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Abstract

The search for habitable worlds is a challenging process but key in our search for life beyond Earth. In this context, the KOBE experiment is aimed at searching for new worlds within the habitable zone of K-dwarf stars through the radial velocity method using the CARMENES instrument. When searching for low-amplitude radial velocity signals, as those produced by rocky worlds, stellar activity is one of the major contaminants. A widely-used procedure to overcome this is to use activity indicators from the spectroscopic data, simultaneously modelling the stellar activity and the radial velocity. However, our simulations show that the KOBE long cadence (~ 9 days) is not enough to properly do so. To overcome this, we are performing a high-cadence photometric monitoring of the KOBE sample stars over the duration of the CARMENES observations (until 2023A) through the robotic telescope STELLA/WiFSIP located in Tenerife. This way, we are able to obtain contemporary and time-resolved information about activity that allows us to use it as a proxy to account for activity in the radial velocity time series. In this contribution we show our modelling procedure, current results, and discuss the capabilities of the CARMENES-WiFSIP synergy in order to facilitate and improve planet detection and characterization.

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