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The radius anomaly of low-mass stars in eclipsing binary systems

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Abstract

Stellar models fail to reproduce the radius of M-dwarfs in eclipsing binary systems, as the measured radii are $\sim$5$-$20% larger than models predict. To properly calibrate models and understand the physical cause of the scatter in M-dwarf mass-radius relationship, mass and radius measurements are required at least at 5% uncertainty level. For that aim, we obtained new measurements (photometry and spectroscopy) across the M-dwarf mass-radius diagram for new low-mass eclipsing binary systems, discovered in the Catalina Sky Survey and from the WFCAM Transit Survey. Combining radial velocity observations with light curves from the mentioned data archives, and Gaia precise data, we have fully characterised these systems in a model-independent way. With the additional sample we have increased the number of known systems at the end of the mass-radius diagram, allowing to further constrain the causes of the radius anomaly problem.

My poster in zenodo.org can be found here