

Searching for planets around evolved massive stars in open clusters: lessons from HARPS

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Our ability to detect planets around stars with the radial-velocity (RV) method has a strong dependence on our understanding on the stellar jitter of such stars which can reach dozens of m/s in red giants. This intrinsic RV variability can be caused by stellar magnetic activity, pulsations or granulation and it behaves on a different way depending on the spectral type of the stars and on their evolutionary stage. In this work we present the results of a RV survey to search for planets around intermediate-mass stars in 25 open clusters. The long-term observations allowed us to discover new binaries, brown dwarfs and few planet candidates around stars more massive than 2 solar masses and we plan to study the dependence of RV jitter on stellar mass, age and evolutionary status. We present the intriguing RV signals detected in some stars, which mimic long-period planets (P~700 days) and are stable for a period of up to 15 years. In some cases, these RVs are correlated with the FWHM or the BIS (Bisector Inverse Slope) of the CCF although their period seems not to be related to the rotational period of the star, nor they show significant chromospheric activity. We discuss the possibility of whether we might be facing a new kind of stellar pulsations or the RV variability is caused by long-term stellar activity. Finally, we discuss about possible observing strategies that can help overcome these issues.

Type

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