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Young planetary systems in the 25 Ori cluster

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Young open clusters provide an ideal environment for the search for extrasolar planets, since they feature a relatively large number of stars of the same known age and metallicity at the same distance. In our project we study one carefully selected young open cluster (25Ori, 10 Myrs) by searching for Jupiter-like planets with transit, astrometry, and direct imaging, so that we can find all planets in a given mass range for all possible separations.

The photometric monitoring of 25 Ori cluster started in January 2010, just using the telescopes of the University Observatory Jena. Then, we have also launched an international observing campaign where we use several 0.2 to 2.6 m telescopes around the world. The telescope network enables us to observe the targets continuously for several days in order not to miss any transit.

In the winters 2010/2011 and 2011/2012 25 Ori was observed within our international observing campaign. The individual observing runs with 15 different telescopes around the world were typically one to two weeks long, about three runs per year. In addition to many new variable stars also a young transiting planet candidate (also found by van Eyken et al. 2012) could be detected.

In December 2010, we obtained 3 nights of direct imaging observation of 25 Ori at VLT with NACO AO. We could obtain infrared images of all 38 most important target stars of our sample. These first epoch images are used for two purposes: (i) astrometric planet search, and (ii) direct imaging search for wide companions. The direct imaging method

already detected one planet candidate. This candidate now awaits 2nd epoch observation for common proper motion confirmation which was granted to us for Dec 2012. I will report about the status and present results of this project.

van Eyken et al. (2012) ApJ, 755, 42

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