P315a Regular Radial velocity variations in Nine G- and K-type Giant Stars: Eight Planets and One Planet Candidate

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We report the detection of radial velocity variations in nine evolved G- and K-type giant stars. The observations were conducted at Okayama Astrophysical Observatory. Planets or planet candidates can best explain these regular variations. However, a coincidence of near 280-day variability among five of them prevents us from fully ruling out stellar origins for some of the variations, since all nine stars behave similarly in stellar properties. In the planet hypotheses to the RV variations, the planets (including one candidate) may survive close to the boundary of the so-called "planet desert" around evolved stars, having orbital periods between 255 and 555 days. Besides, they are the least-massive giant planets detected around G- and K-type giant stars, with minimum masses between $0.45M_{\rm J}$ and $1.34M_{\rm J}$. We further investigated other hypotheses for our detection, yet none of them can better explain regular RV variation. With our detection, it is convinced that year-long regular variation with amplitude down to 15 m/s for G- and K-type giant stars is detectable. Moreover, we performed simulations to further confirm the detectability of planets around these stars. Finally, we explored giant planets around intermediate-mass stars, and likewise found a 4 Jupiter mass gap (e.g. Santos et al. 2017, A&A, 603, A30), which is probably a boundary of the giant planet population.