

Abstract Submitted
for the SES16 Meeting of
The American Physical Society

Combing the Brown Dwarf Desert with APOGEE¹ NICHOLAS TROUP, University of Virginia, APOGEE RV VARIABILITY TEAM TEAM — While numerous stellar and planetary-mass companions have been found, there has been a paucity of brown dwarf (BD) companions orbiting Sun-like stars, a phenomenon known as the BD desert. However, more recent work has shown that this desert might be limited in extent, only existing for small separation ($a < 3$ AU) companions, and may not be as dry as initially thought. The Apache Point Observatory Galactic Evolution Experiment (APOGEE) has compiled a catalog of 382 of its most compelling stellar and substellar companion candidates. Among these, 112 have a derived companion mass in the BD regime ($13 - 80M_{Jup}$), which is a significant increase compared to the number of known small separation ($a < 1$ AU) BD companions. Our sample appears to manifest the BD desert, but only for $a < 0.2$ AU rather than the previously held 3. This is explained by one of the unique qualities of our sample when compared to previous companions surveys: Two-thirds of the BD candidates in our sample are orbiting evolved stars, most of which were F dwarfs during their main sequence lifetime, consistent with the notion of an F dwarf oasis. Using this sample, we further test this hypothesis by constraining the formation mechanisms of BD companions, and exploring their orbital evolution as their host evolves.

¹This work was graciously funded by a Virginia Space Grant Graduate Research Fellowship and NSF grant AST1616636

Nicholas Troup
University of Virginia

Date submitted: 06 Oct 2016

Electronic form version 1.4