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The Chemical Composition of Planet-Harboring Stars in M67 PARKER H HOLZER, INESE IVANS, JESSICA GALBRAITH-FREW, TIM ANDERTON, University of Utah, APOGEE TEAM — At the forefront of observational astronomy is the search for, and an understanding about the nature of, stars containing planetary companions. To contribute to this search, we have studied stars in the open cluster Messier 67 (M67), a cluster known to have many stars very comparable to the Sun. At least four dwarf stars in this cluster have shown evidence in previous studies to contain planets. We studied these, as well as about thirty four other F-dwarf stars in M67, by using high signal-to-noise infrared stellar spectra from APOGEE (Apache Point Observatory Galactic Evolution Experiment; a part of the Sloan Digital Sky Survey). Because stars in an open cluster are born from the same material and approximately at the same time, they are in general expected to all have very similar chemical compositions. However, after using spectral synthesis to derive the temperature, gravitational acceleration at the surface, and overall chemical enrichment of the stars in our sample, we have shown that the chemical composition of stars in the cluster is not homogeneous, but instead exhibits a spread. Further, we have shown that this spread may possibly be due to the presence of planet-harboring stars. Our findings suggest that planet-harboring stars are richer in refractory elements and poorer in volatile elements, giving a deeper understanding of the environments in which planets are likely to form.

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