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# The APOKASC Catalog: Spectroscopic, Asteroseismic, and Rotational Data for a Large Sample of Kepler Stars

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## Abstract

The Kepler mission has revolutionized our understanding of stellar and planetary astrophysics through its ultra-precise time domain coverage of a large ( $\sim 160,000$ ) sample of stars. Transit studies have discovered thousands of eclipsing binaries and planet candidates, and tens of thousands of stellar rotation periods have been reported. Non-radial oscillations have been detected and characterized in hundreds of dwarfs and subgiants and thousands of evolved giants. However, spectroscopy is essential for taking full advantage of these powerful new measurements, and the Kepler sample demands multi-object capabilities over a wide field of view. The APOGEE spectrograph has obtained  $\sim 10,000$  high-resolution IR spectra of targets in the Kepler fields, including  $\sim 8,500$  stars with asteroseismic data. Here we report the initial results of the joint APOGEE-KASC, or APOKASC, catalog. This catalog differs from the spectroscopic norm by the inclusion of asteroseismic information for a large sample of red giants and a substantial number of less evolved stars. In particular, asteroseismic surface gravities provide powerful constraints on model atmospheres, and asteroseismic diagnostics of evolutionary state can complement traditional HR-diagram based criteria. We highlight some significant early results, including tests of the asteroseismic mass scale, isochrones, distances and extinctions in the Kepler fields, bulk metallicities, and tests of gyrochronology. Future prospects are also discussed.

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