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# A mixture of tidally-excited and kappa-driven p- and g-modes in the Kepler eccentric binary KIC10080943

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## Abstract

We present the analysis of four years of Kepler data and high-resolution ground-based spectroscopy of the star KIC10080943. The radial velocity data, obtained with the HERMES spectrograph at Mercator telescope, reveal that this early F-type star is a double-lined, eccentric binary with an orbital period of 15.337 days, an eccentricity of 0.46, and a mass ratio close to unity. The light curve shows brightenings at the orbital period with an amplitude of 0.56 mmag, buried under much higher-amplitude stellar oscillation signals in the characteristic gamma Dor and delta Sct frequency ranges. KIC10080943 has a very rich pulsation spectrum. Besides numerous heat-driven gravity and pressure modes we also detect a tidally-induced pulsation mode at the 15th harmonic of the orbital frequency, which is embedded in a comb of seven modes that are equally spaced in period. Multiplets in the p mode regime show frequency spacings of close to twice the orbital frequency. The observed spectrum will allow for seismic modelling of at least one of the binary components, which makes this system a particularly promising test case for theories of stellar evolution and tidal interaction.

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