

# Time-series photometry of the O4 I(n)fp star zeta Puppis

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We report a time-series analysis of the O4I(n)fp star zeta Pup, based on optical photometry obtained with the SMEI instrument on the Coriolis satellite, 2003--2006. A single astrophysical signal is found, with  $P = (1.780938 \pm 0.000093)$  d and a mean semi-amplitude of  $(6.9 \pm 0.3)$  mmag. There is no evidence for persistent coherent signals with semi-amplitudes in excess of ca. 2~mmag on any of the timescales previously reported in the literature. In particular, there is no evidence for a signature of the proposed rotation period, ca. 5.1~days; zeta Pup is therefore probably not an oblique magnetic rotator. The 1.8-day signal varies in amplitude by a factor ca. 2 on timescales of 10-100d (and probably by more on longer timescales), and exhibits modest excursions in phase, but there is no evidence for systematic changes in period over the 1000-d span of our observations. Rotational modulation and stellar-wind variability appear to be unlikely candidates for the underlying mechanism; we suggest that the physical origin of the signal may be pulsation associated with low-l oscillatory convection modes.

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