

SMALL BODIES

Little dippers are comets playing chicken

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The Kepler mission, and particularly its K2 extension, revealed many examples of pre-main sequence stars that exhibit sporadic drops in flux (~10%) in their lightcurves that last for a day or two. This group of stars, which shares the characteristics of having infrared excesses indicative of circumstellar disks and line emission indicative of accretion, have come to be known as dippers. Megan Ansdell and collaborators have recently identified two stars in the K2 data that have shallower versions of these dips (~1% drops). Whereas the dipper phenomenon is thought to be related to clumps of circumstellar dust possibly within circumstellar disks, these 'little dipper' stars might be orbited by star-grazing exocomets and do not show any signs of having disks, say Ansdell and colleagues.

Evidence for the existence of exocomets was presented earlier this year by Saul Rappaport et al. (*Mon. Not. R. Astron. Soc.* **474**, 1453–1468; 2018), who discovered two Kepler stars with shallow dips. Analysis

of the shapes, depths and durations of the transit features agreed very well with models of dusty-tailed comets. Ansdell et al. follow a similar procedure, additionally fitting archival photometric measurements of their K2 stars (EPIC 205718330 and EPIC 235240266) to identify them as main sequence mid-K and late-F dwarf stars, respectively. These two stars, similarly to Rappaport's pair, are clearly more evolved than the dippers.

Ansdell et al. comment on the rarity of these exocometary transit events — 17 examples from four stars. This scarcity might reflect Kepler sensitivity limits, but alternatively, if these are due to star-grazing comets, perhaps the lack of events is indicative of the lack of massive, perturbing outer planets.

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