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P/2010 A2: A dust-producing inner-belt asteroid

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Abstract

P2010/A2 was discovered by the LINEAR sky survey in January 2010. It is a small object on an asteroidal orbit in the inner asteroid belt displaying a dust tail similar to that of a comet, but with peculiar features that are not readily explained by sublimation-driven cometary activity. We therefore suggest that the dust cloud following P/2010 A2 may have been produced by an impulsive event (such as a collision or rotational spin-up) instead of by continuous emission. Using high resolution data taken over the half year following the discovery of P/2010 A2, we constrain the emission time of the dust, its size distribution, mass, and initial velocities, and discuss the results with respect to different ejection scenarios.