

Abstract Submitted
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Characterizing thermal sweeping: a rapid disc dispersal mechanism MATHIAS HUDOBA DE BADYN, University of British Columbia, JAMES E. OWEN, Canadian Institute for Theoretical Astrophysics, University of Toronto, CATHIE J. CLARKE, Institute of Astronomy, University of Cambridge, LUKE ROBBINS, University of Cambridge — Protoplanetary discs form from the remnants of the accretion discs left over after star formation. Inside these discs, planets and other planetary objects are formed. To constrain timescales of planet formation, an important area of research is in protoplanetary disc dissipation. We study the photoevaporation of discs in their late lifetimes, in particular a dynamically short period of intense dissipation called thermal sweeping, ending in the destruction of the disc. This mechanism is proposed to occur when the inner edge of the disc reaches a sufficiently low surface density, and the disc is dynamically unstable to runaway x-ray penetration. We present numerical simulations that show thermal sweeping has a linear x-ray luminosity dependence, and we discuss the critical surface density for the process to occur.

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