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Particle Transport and Thermal Processing during FU Orionis Events in the Solar Nebula
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Solar-type young stars undergo ˜100-year-long
FU Orionis outbursts roughly every ˜ 0.01 Myr during their early
evolution. Such outbursts are thought to be caused by rapid mass accretion
by the protostar during phases when the disk is marginally gravitationally
unstable (MGU). We study here the trajectories of particles embedded
in the solar nebula during a MGU phase of disk evolution.
These trajectories have profound cosmochemical consequences,
ranging from large-scale outward transport of refractory grains, such
as the calcium, aluminum-rich inclusions (CAIs) found in Comet Wild 2
by the Stardust Mission, to an explanation for a CAI found in Allende
whose variations in oxygen isotopes imply repeated passages both inward
and outward in the disk, to time scales (˜ 10 yr) for sublimation
of CAIs similar to those inferred for a Leoville CAI, as well as for
the transport and mixing of ices throughout the nebula.

キーワード: CAIs, solar nebula, FU Orionis, thermal processing, WL rims, transport
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