

Abstract Submitted
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Tidal Disruptions Events with Prompt Hyperaccretion CHRISTOPHER EVANS, PABLO LAGUNA, Georgia Inst of Tech — A bright flare from a galactic nucleus followed at late times by a $t^{-5/3}$ decay in luminosity is often considered to be the signature of a tidal disruption of a star by a massive black hole. The flare and afterglow are produced when the stream of stellar debris released by the disruption returns to the vicinity of the black hole, self-intersects, and eventually forms an accretion disk or torus. In the canonical scenario of a solar-type star disrupted by a $10^6 M_\odot$ black hole, the time between the disruption of the star and the formation of the accretion torus could be years. We present fully general relativistic simulations of a new class of tidal disruption events involving ultra-close encounters of solar-type stars with intermediate mass black holes. In these encounters, a thick disk forms promptly after disruption, on timescales of hours. After a brief initial flare, the accretion rate remains steady and highly super-Eddington for a few days at $\sim 10^2 M_\odot \text{yr}^{-1}$.

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