

Formation of Intermediate-Mass Black Holes near the Galactic Center

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Outline:

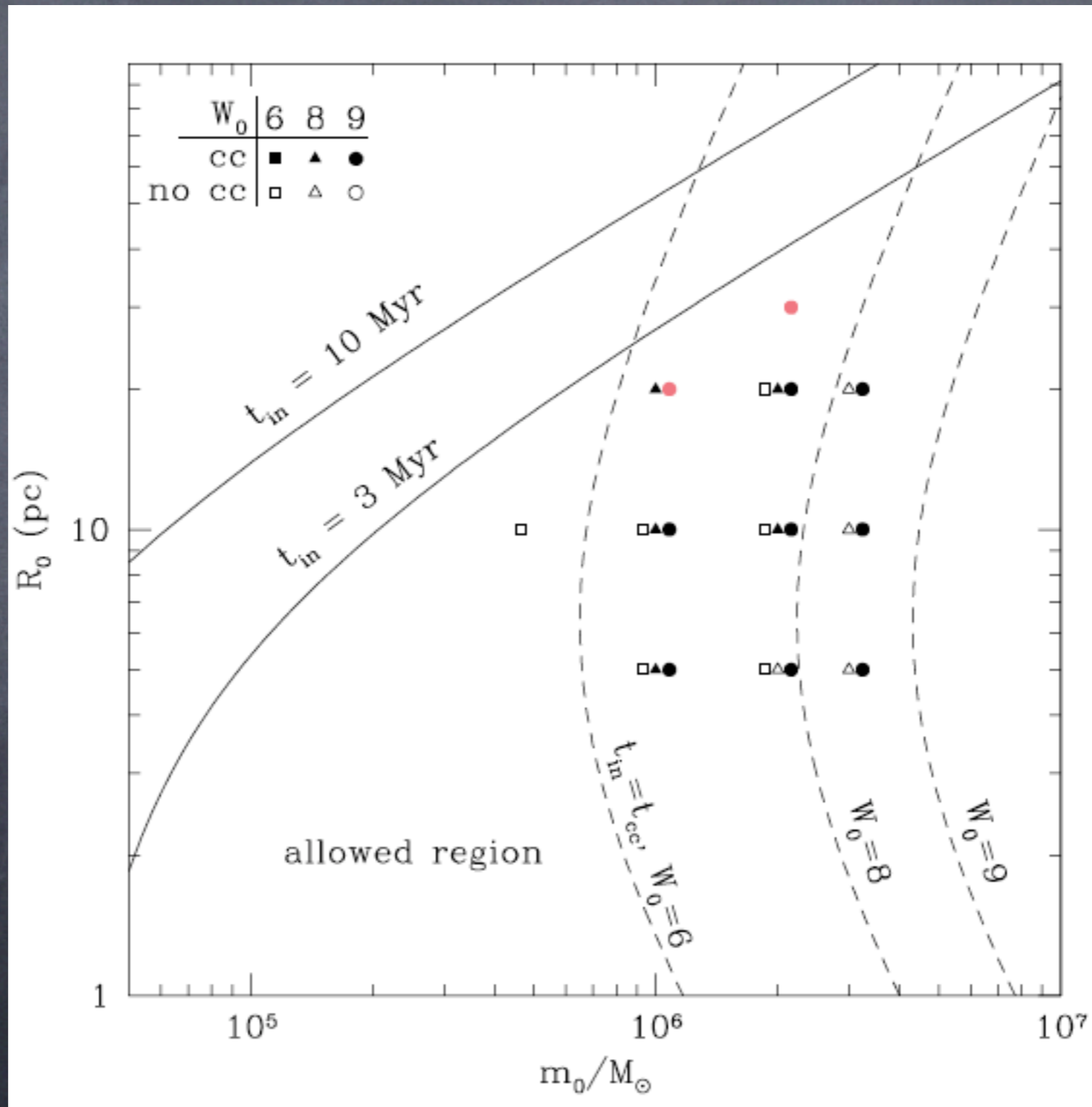
- Basic Runaway Scenario and application to bringing young stars into the GC
- Results from latest Monte Carlo simulations:
 - for runaway collisions and IMBH formation
(Freitag et al. 2005 astro-ph/0503129 and 0503130)
 - for inspiral and tidal disruption of young clusters in GC (Gürkan & Rasio 2005, ApJ, in press)

Basic Ideas:

- Young stars observed near GC ($r \ll 1\text{pc}$) could form much further out ($r > 10\text{pc}$) in star clusters that later undergo inspiral (Gerhard 2001, ApJ 546 L39)
- Star cluster gets tidally disrupted before reaching $r \ll 1\text{pc}$ unless central density is extremely high (Kim & Morris 2003, ApJ 597, 312)
- Core collapse may occur before disruption, leading to IMBH formation through runaway collisions (Hansen & Milosavljevic 2003, ApJ 593, L77)

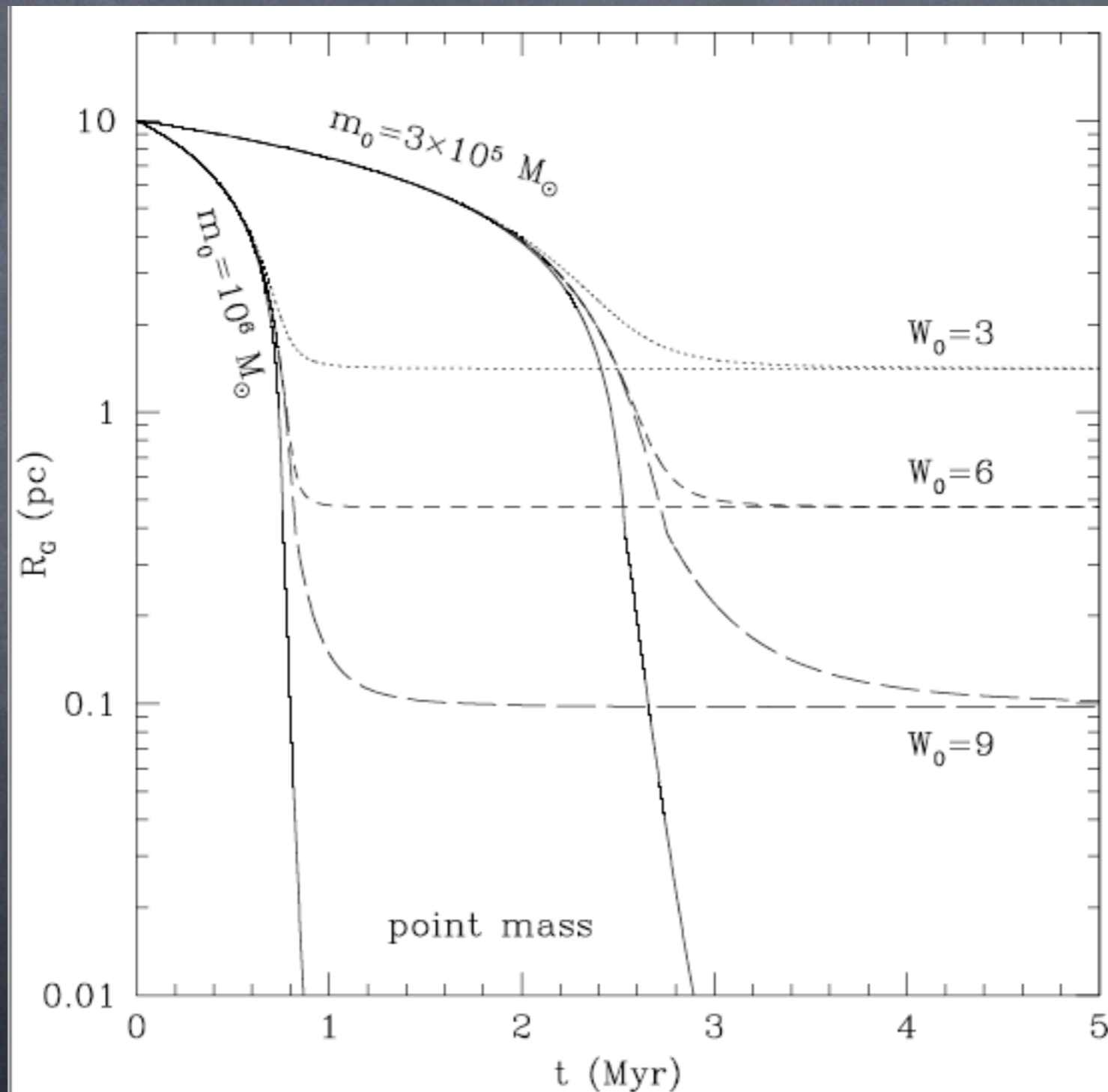
Allowed Parameter Space

(Gürkan & Rasio 2005, ApJ, in press)



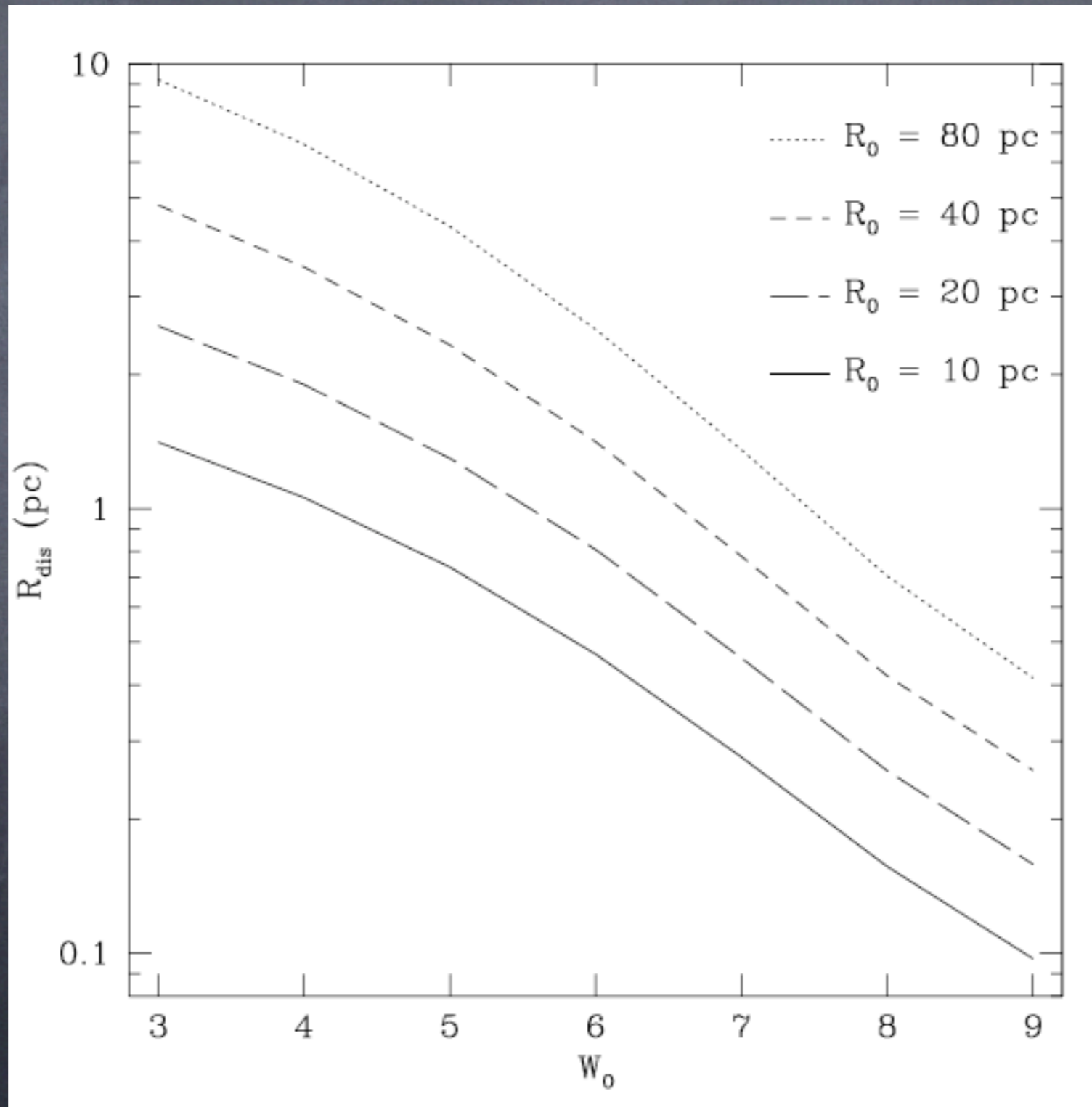
Inspiral to Tidal Disruption

(Gürkan & Rasio 2005, ApJ, in press)



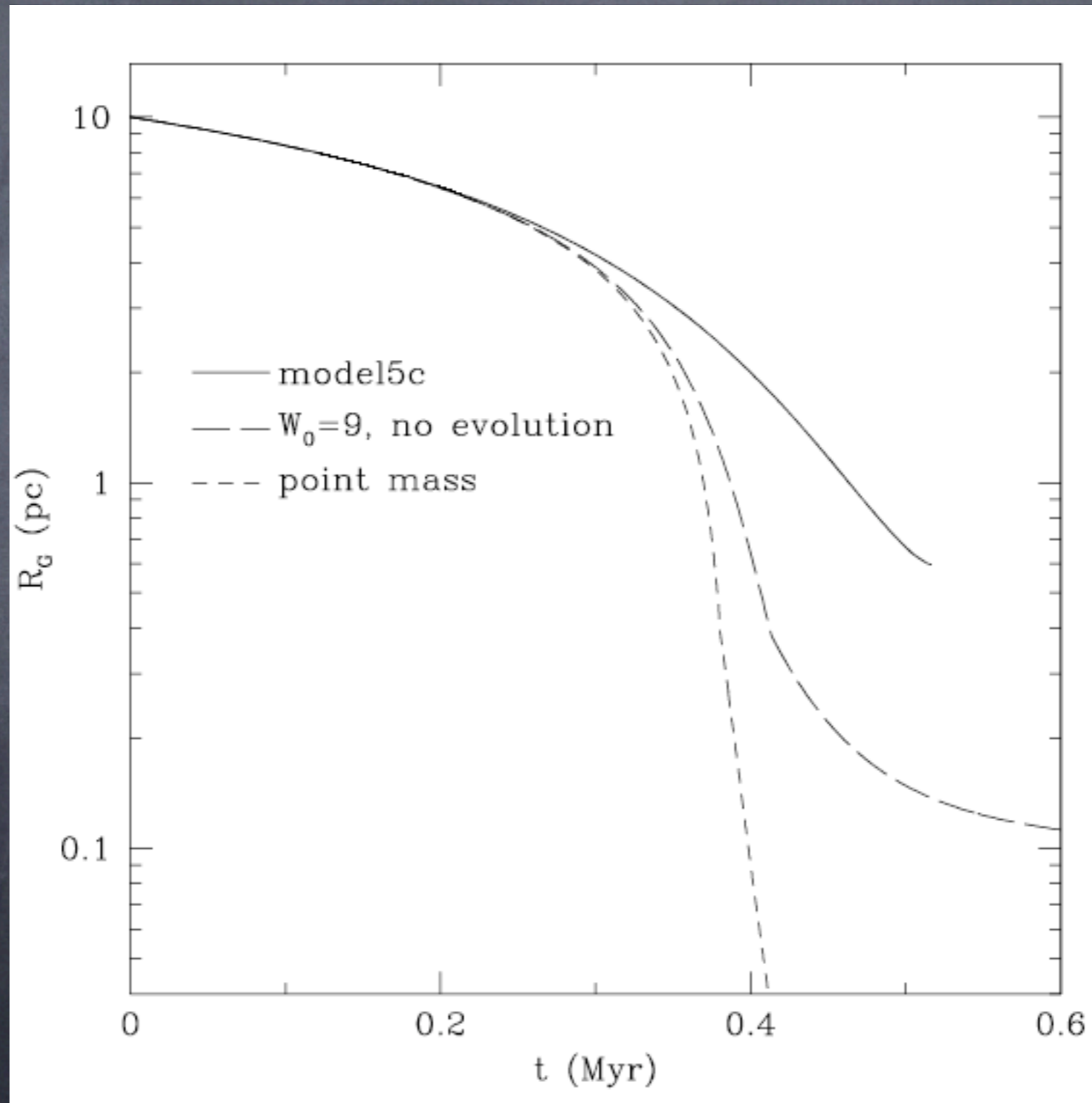
Tidal Disruption Radius

(Gürkan & Rasio 2005, ApJ, in press)



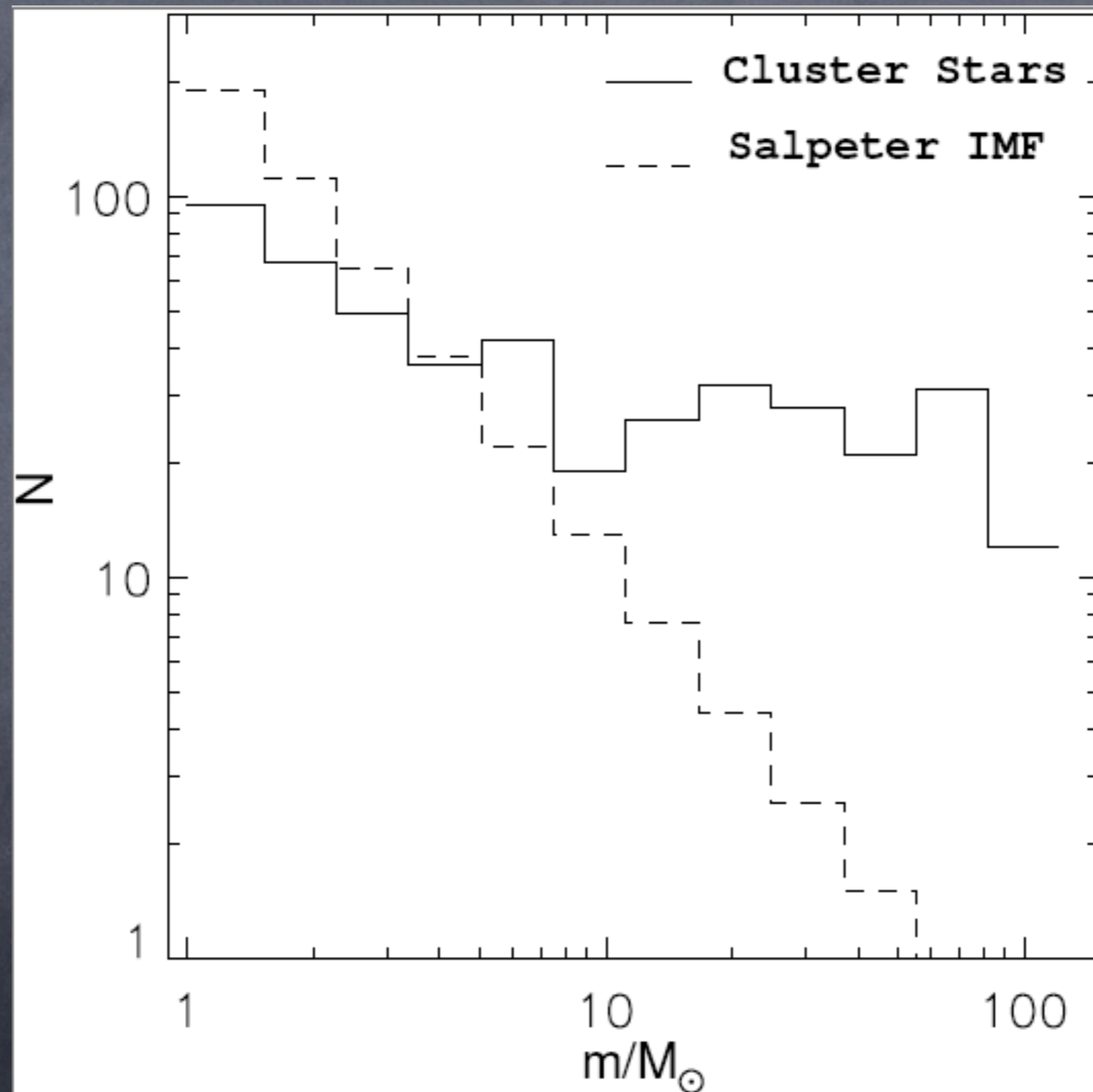
Cluster Inspiral in Time

(Gürkan & Rasio 2005, ApJ, in press)



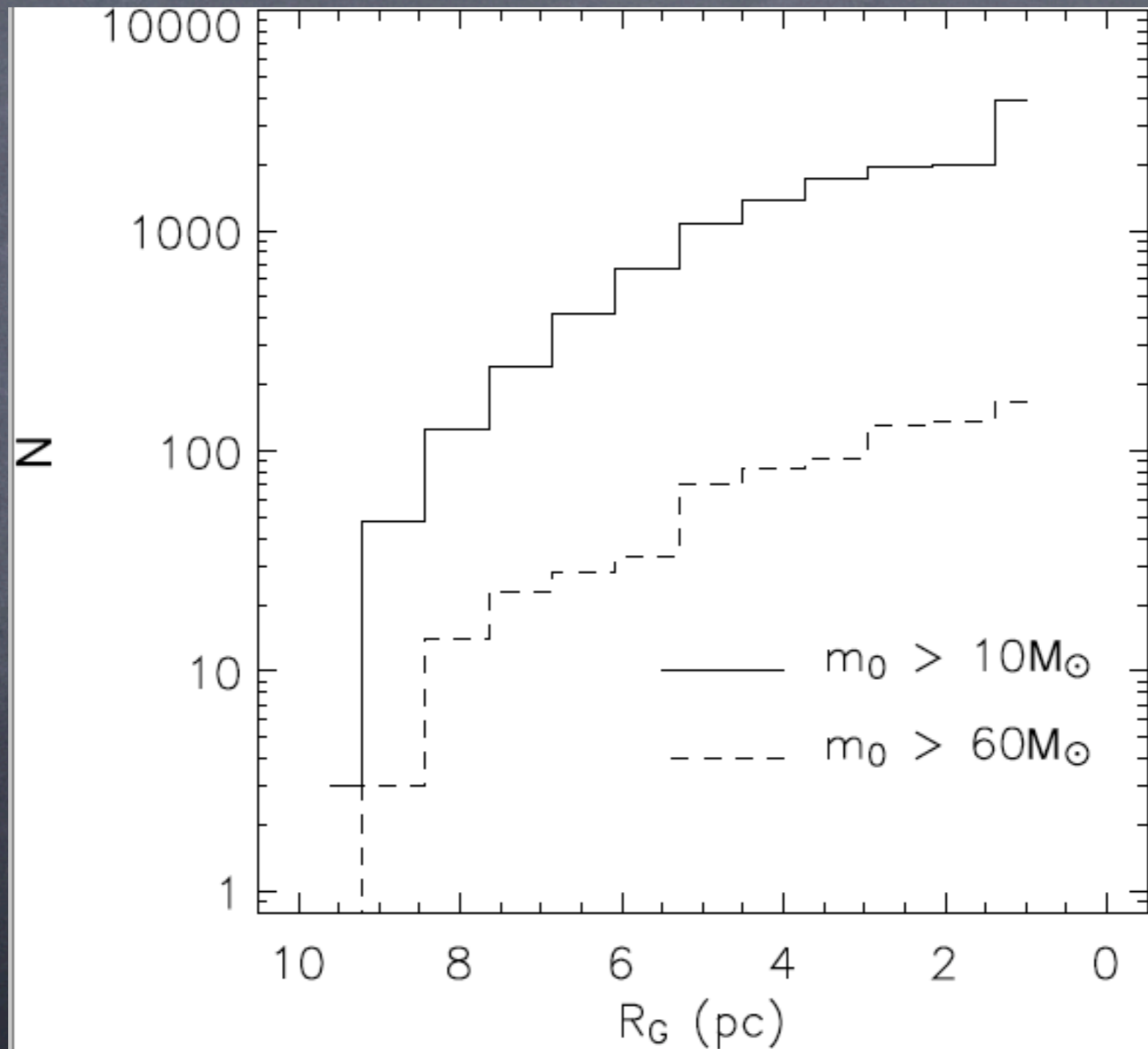
Stellar MF in IMBH Cusp

(Gürkan & Rasio 2005, ApJ, in press)



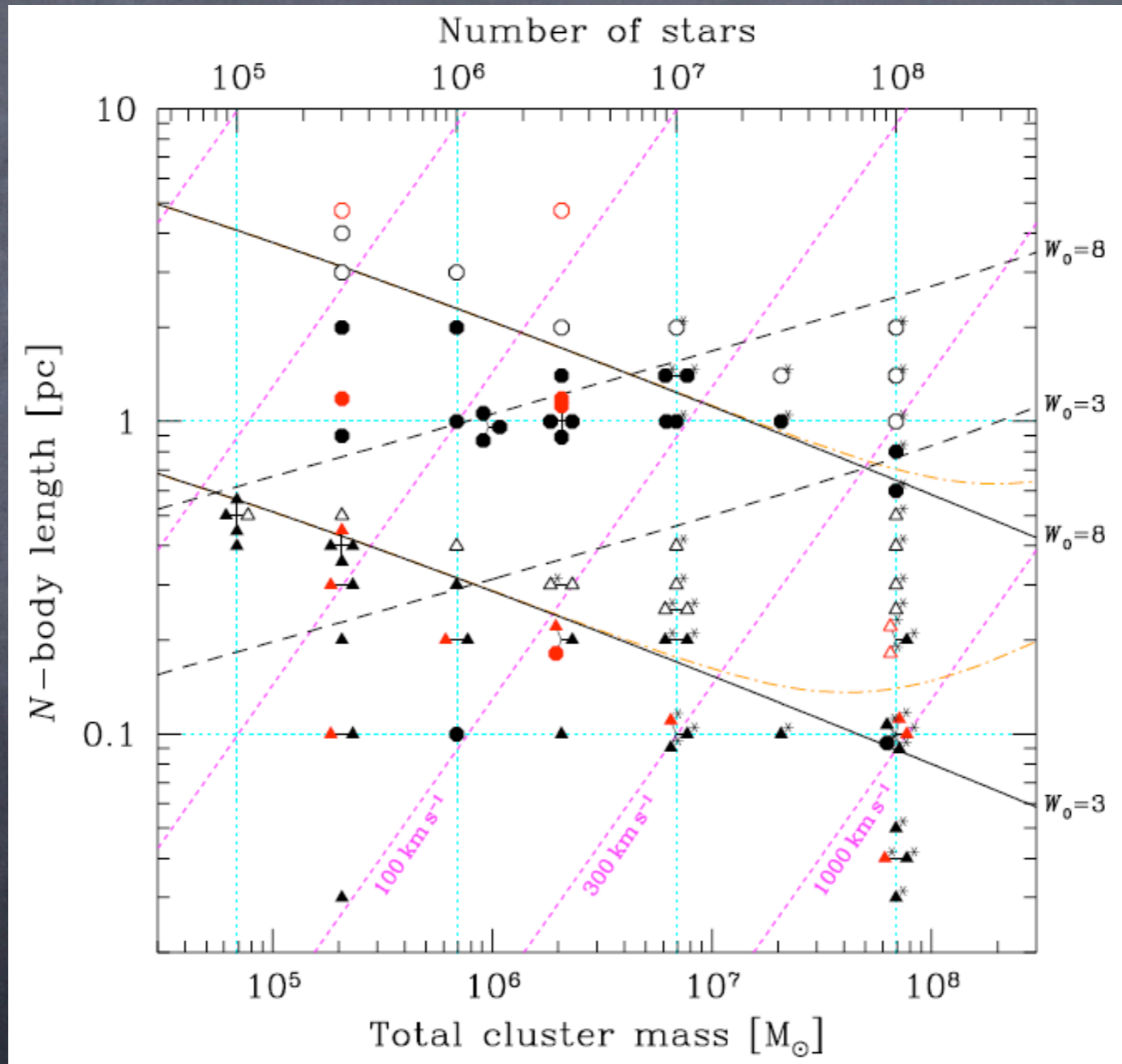
Too many young stars?

(Gürkan & Rasio 2005, ApJ, in press)



Latest Results on Runaways

(Freitag, FR, & Baumgardt 2005; Freitag, Gürkan, & FR 2005)



Runaway Collisions during Core Collapse

