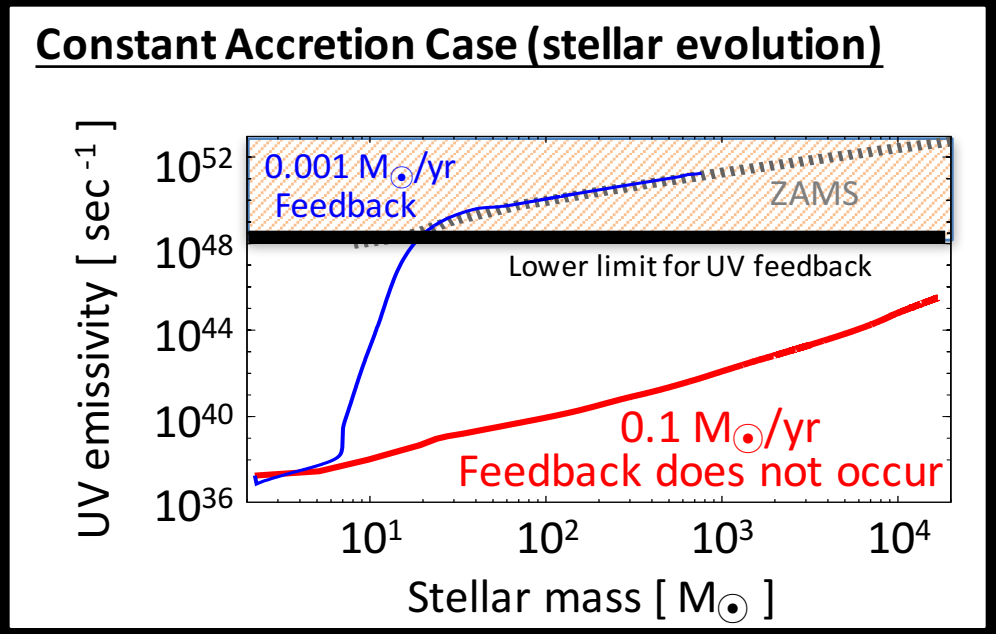
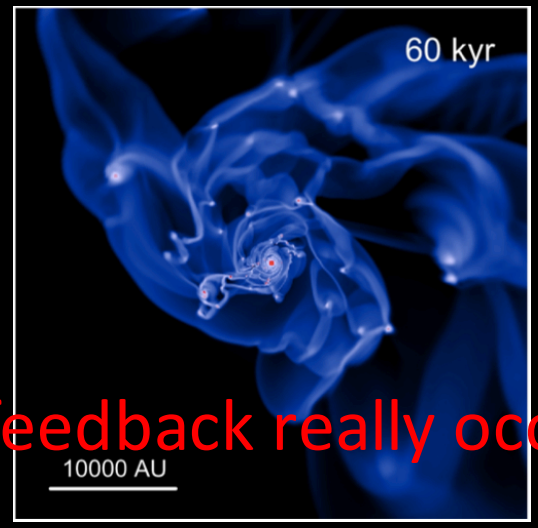
PAPER NO. 775

EPISODIC ACCRETION IN SUPERMASSIVE STAR FORMATION AND FORMATION OF SMBH SEEDS IN THE EARLY UNIVERSE

- INTRODUCTION
  - Supermassive stars (SMSs) with ~10^5 Msun can form by rapid mass accretion without feedback for const. acc. case



- MOTIVATION
  - In reality, episodic accretion occurs by disc instability
  - In this case feedback can occur and suppress SMS formation if acc. rate is temporarily low



Does feedback really occur???

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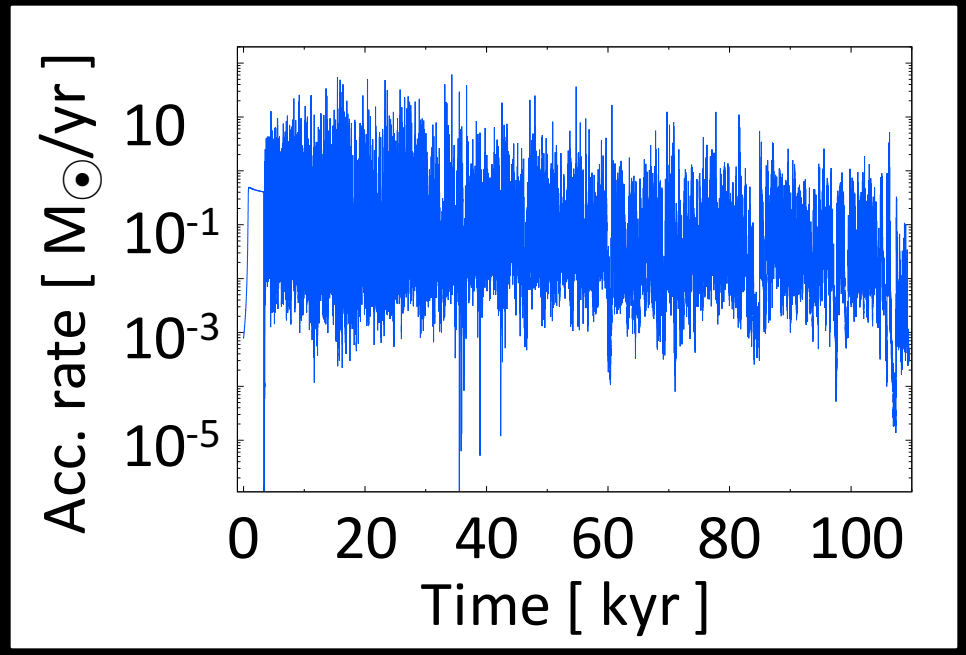
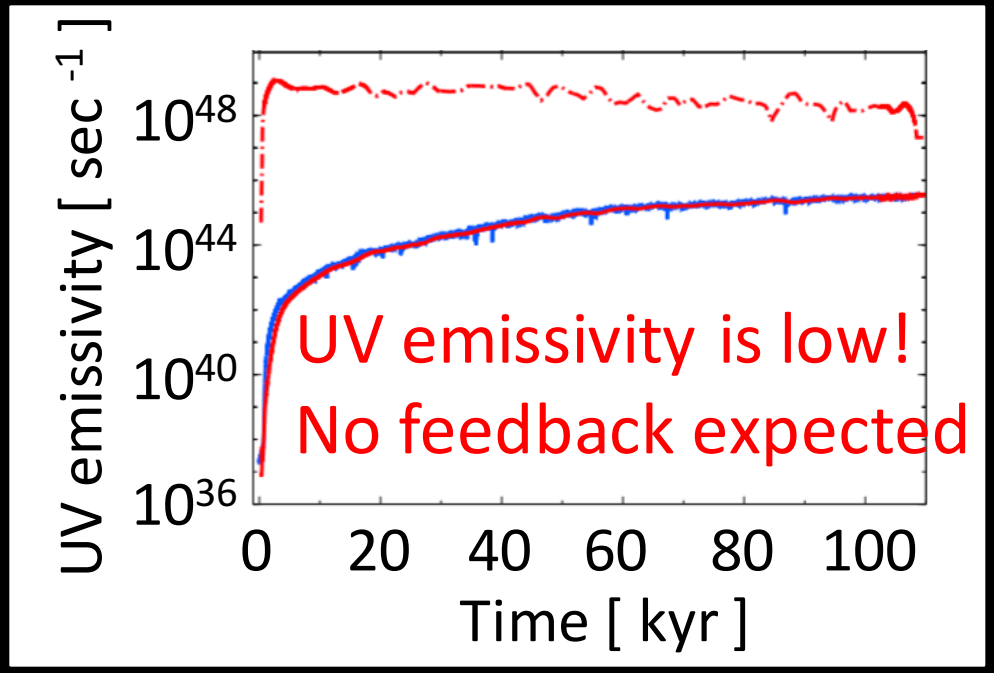
- METHODS & RESULTDS
  - ① 2D hydrodynamical sim. →calculating episodic accretion history
  - ② Stellar evolution calculation →obtaining UV emissivity by using the accretion history





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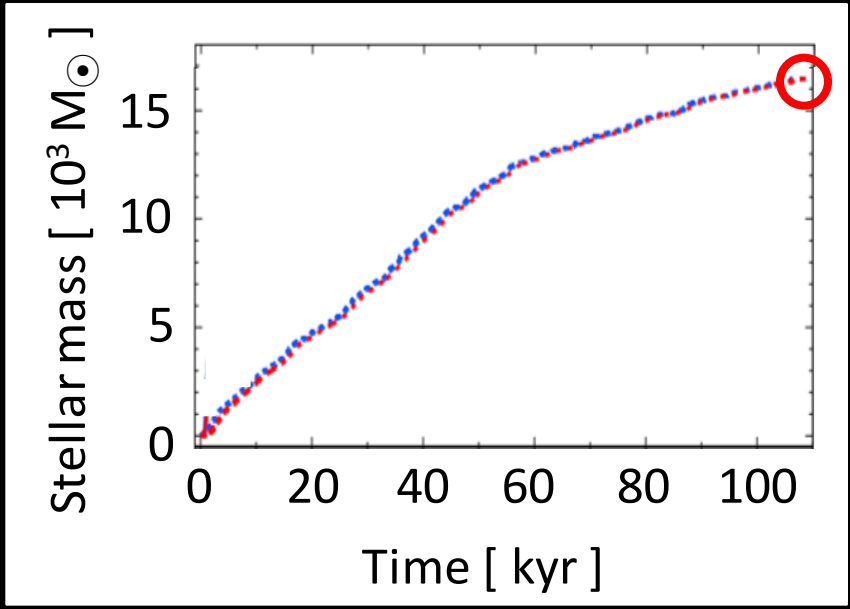
- IMPLICATIONS
  - SMSs with > 10^4 Msun can form within 10^5 yr without feedback



- Extrapolating the results to higher mass, SMSs with $10^{5\text{-}6}$ Msun will form
- SMSs with $10^{5\text{-}6}$ Msun directly collapses to BHs by GR instability
- These BHs can be seeds for supermassive black hole @ z=6-7