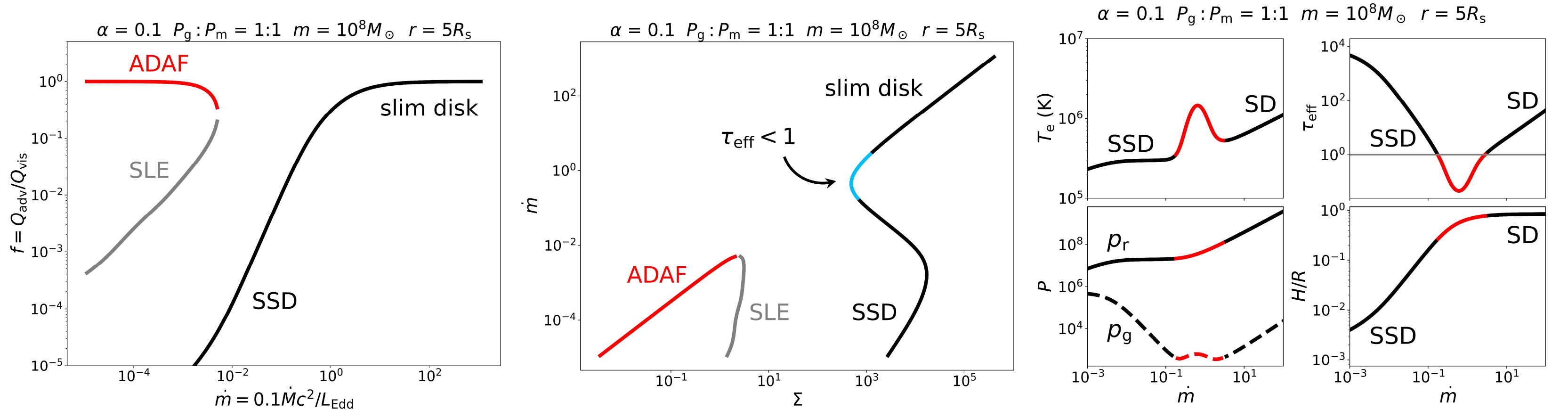


The generalized self-similar solution of ADAF, SLE, standard disk and slim disk

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We present a generalized self-similar solution to unify four solution describing accretion flow, i. e., the advection-dominated accretion flow (ADAF), the Shapiro-Lightman-Eardley (SLE) disk, the standard thin disk (SSD) and the slim disk (SD), which also indicates the importance of an effectively optically thin solution for Active Galactic Nuclei (AGN).

Method: our solution is based on the equations of accretion flow including the radiation pressure and photon trapping self-consistently.



1. Our solution can reproduce the ADAF, SLE, SSD and slim disk branches in a wide range of accretion rate.
2. An effectively optically thin solution occurs in the innermost region for massive black hole around Eddington accretion rate, which is high temperature, thermal stable, radiation pressure and electron scattering dominated.