

Accretion Flows and Jets

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URJA2005 Banff
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Simulating Accretion Disks

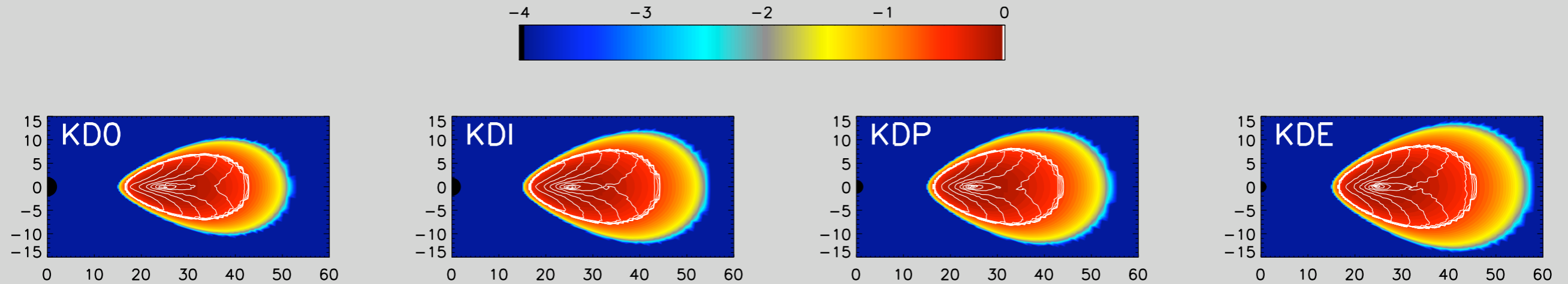
3D GRMHD:

- Explicit 3+1 FD code, Kerr background (BL)
- Equations of motion from conservation laws
- Induction equation using Constrained Transport

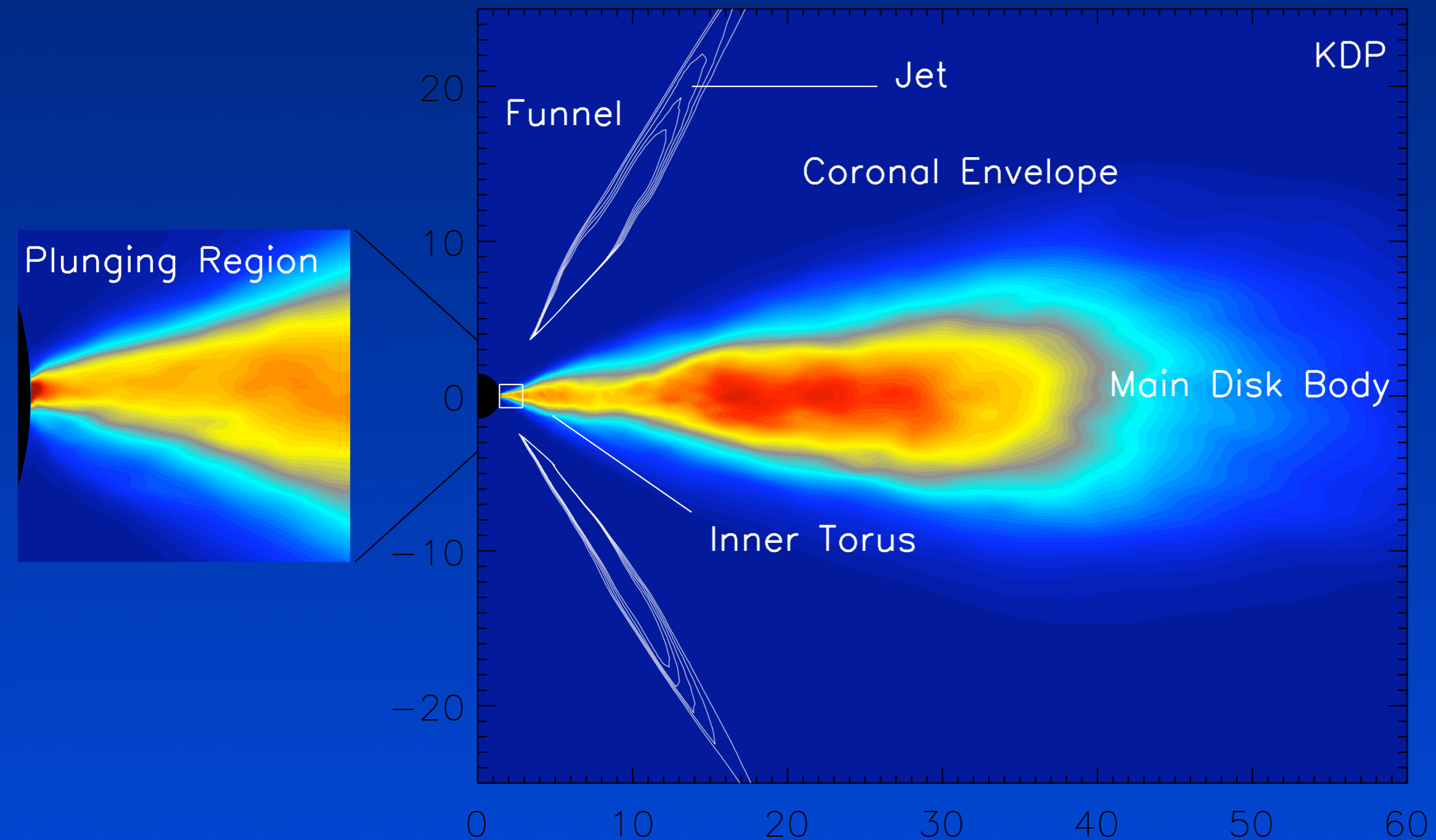
Initial Conditions:

- Torus + seed magnetic field (MRI)
- Ambient medium: dust + external field

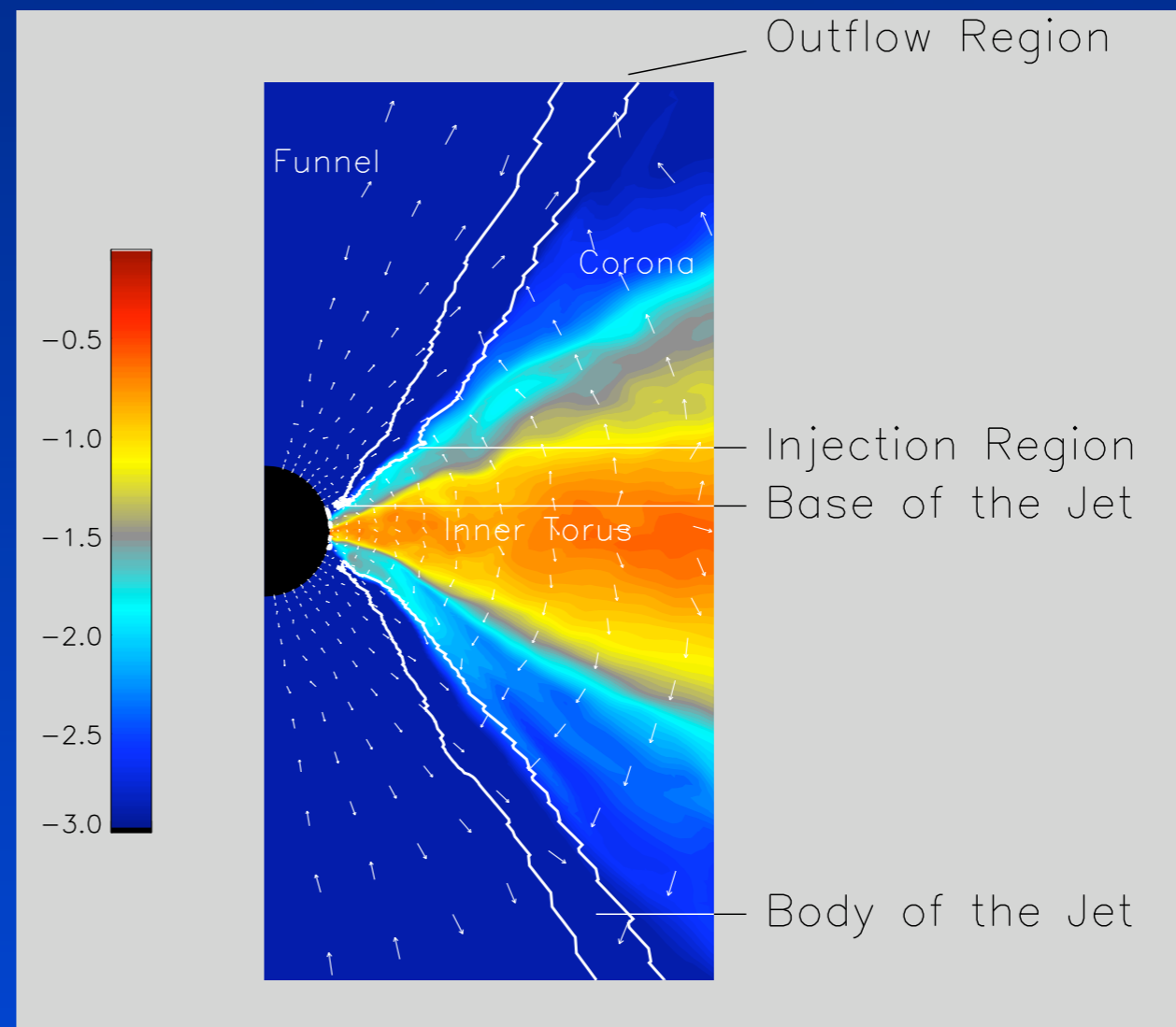
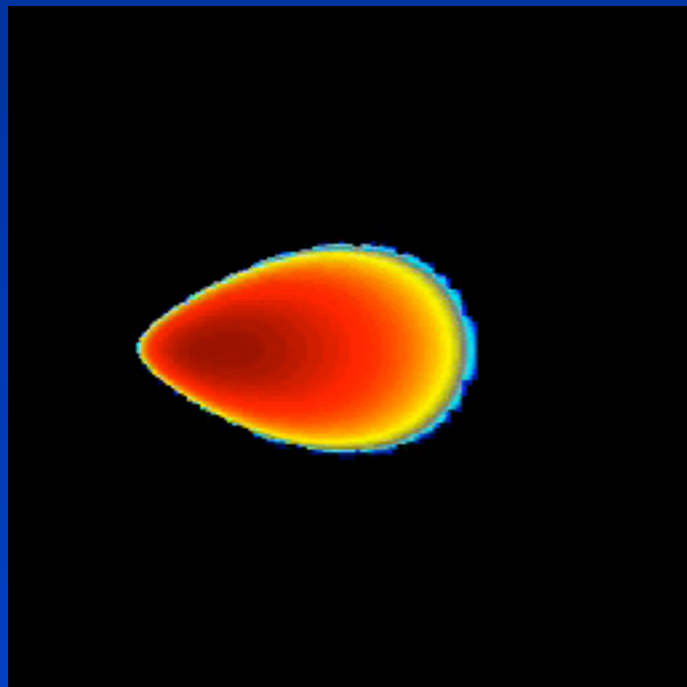
Initial State



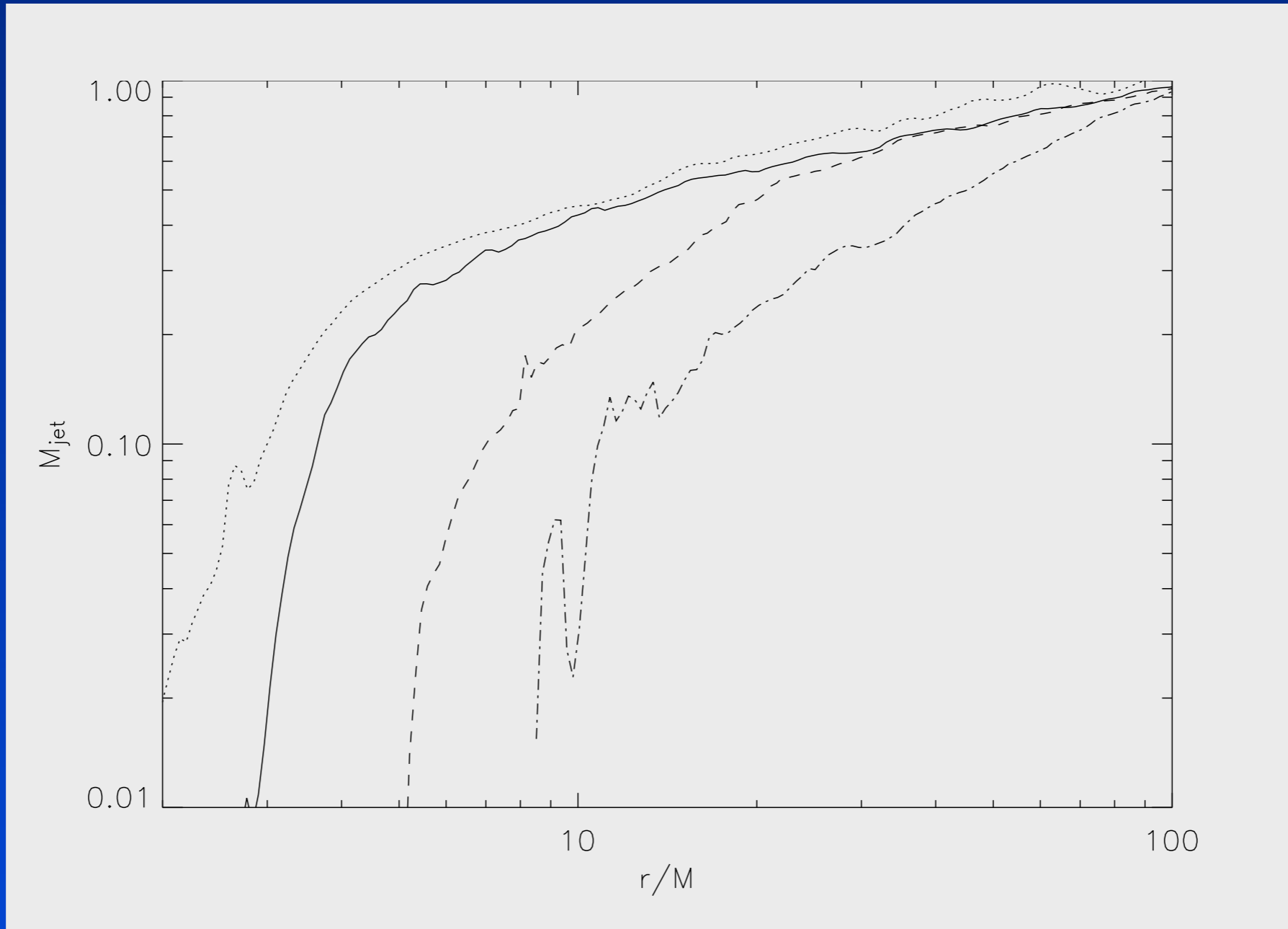
Late-time State



KDP Disk and Jets



Jet Mass in KD Tori

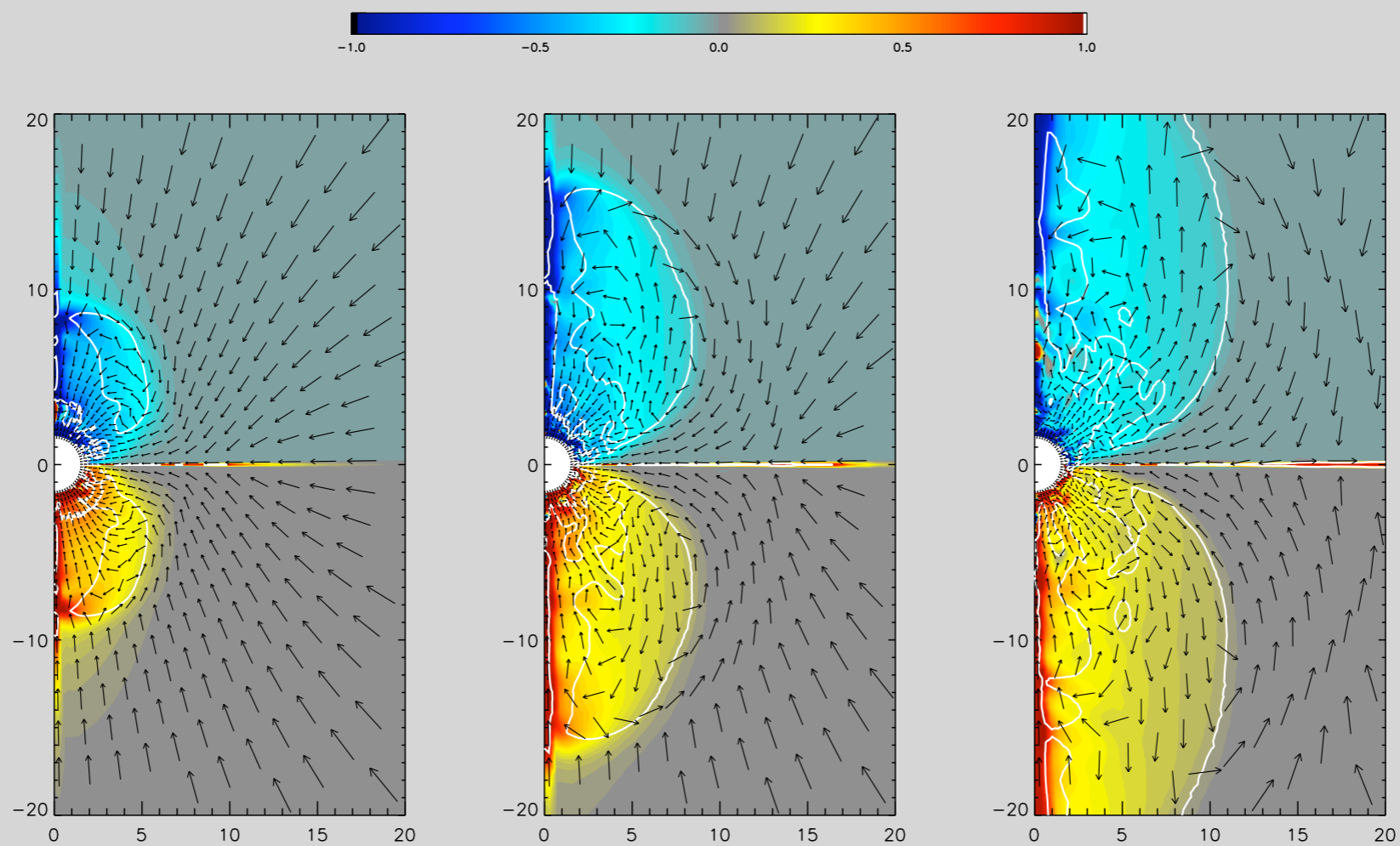


Recent Work

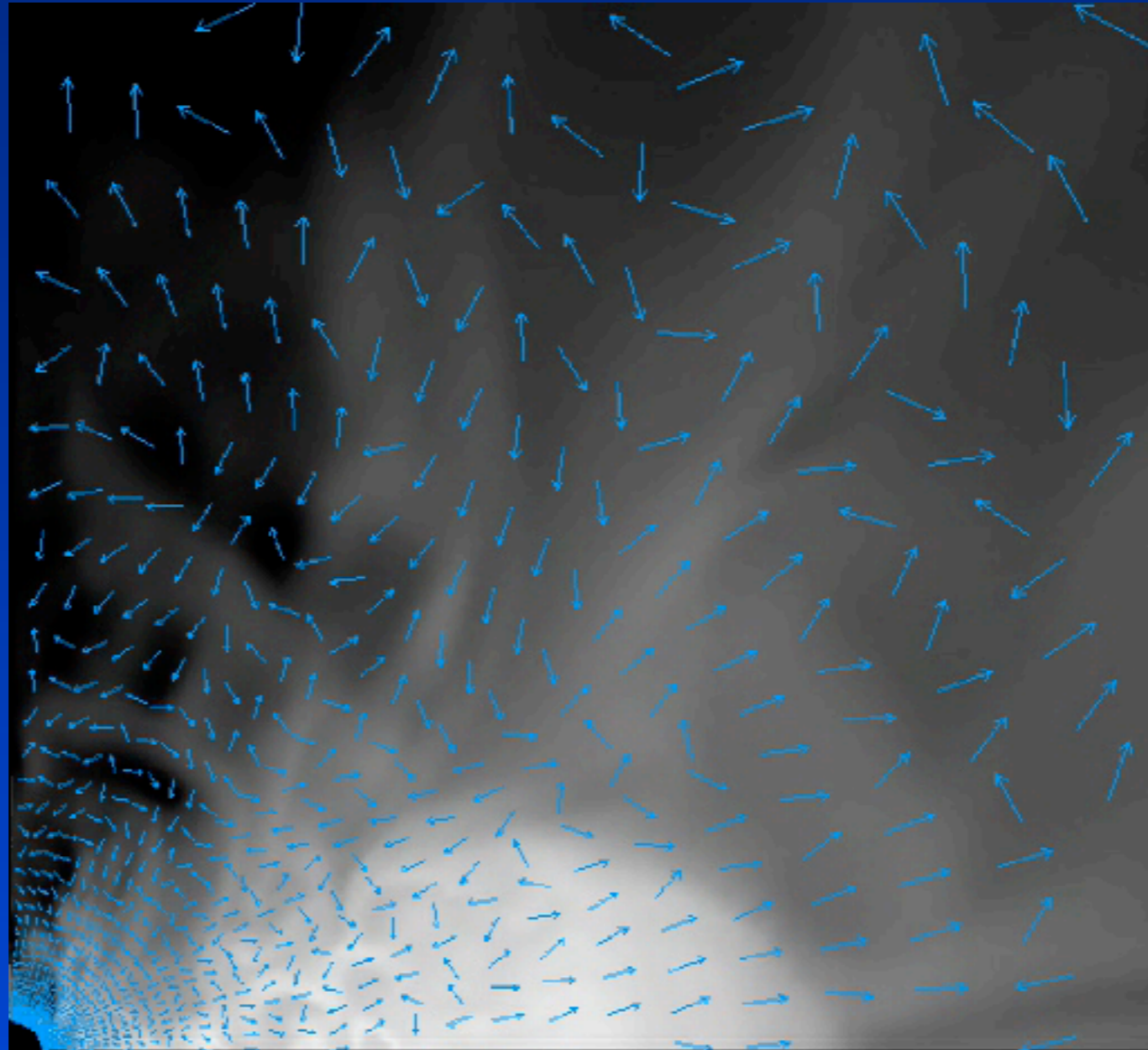
Torus + dust + Wald Field

- Many 2D simulations, larger grid
- One large 3D simulation (192^3 grid)
- Integrated fluxes in jet

Dust and Wald Field



SF Torus



(azimuthal field)

Future Work

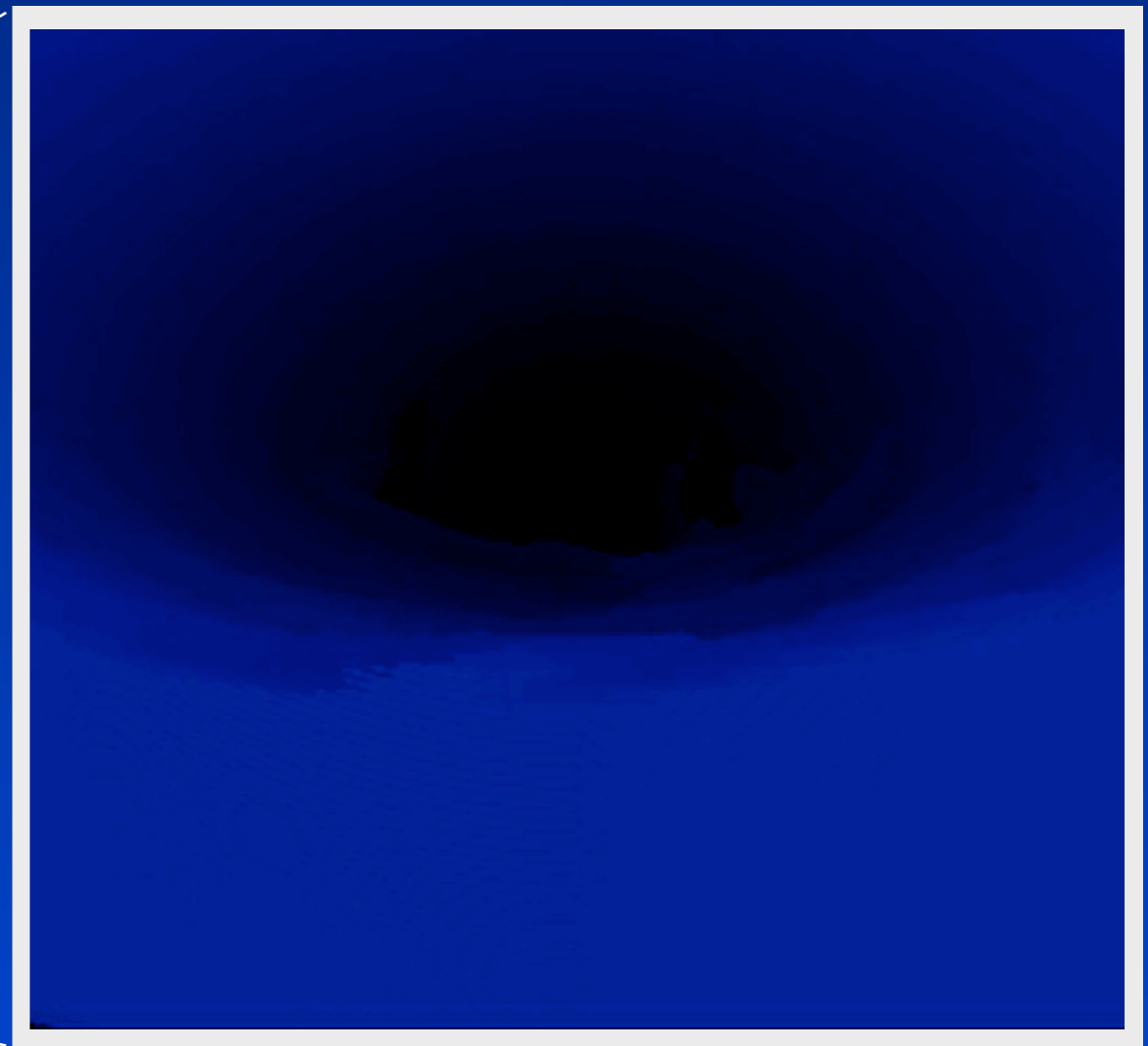
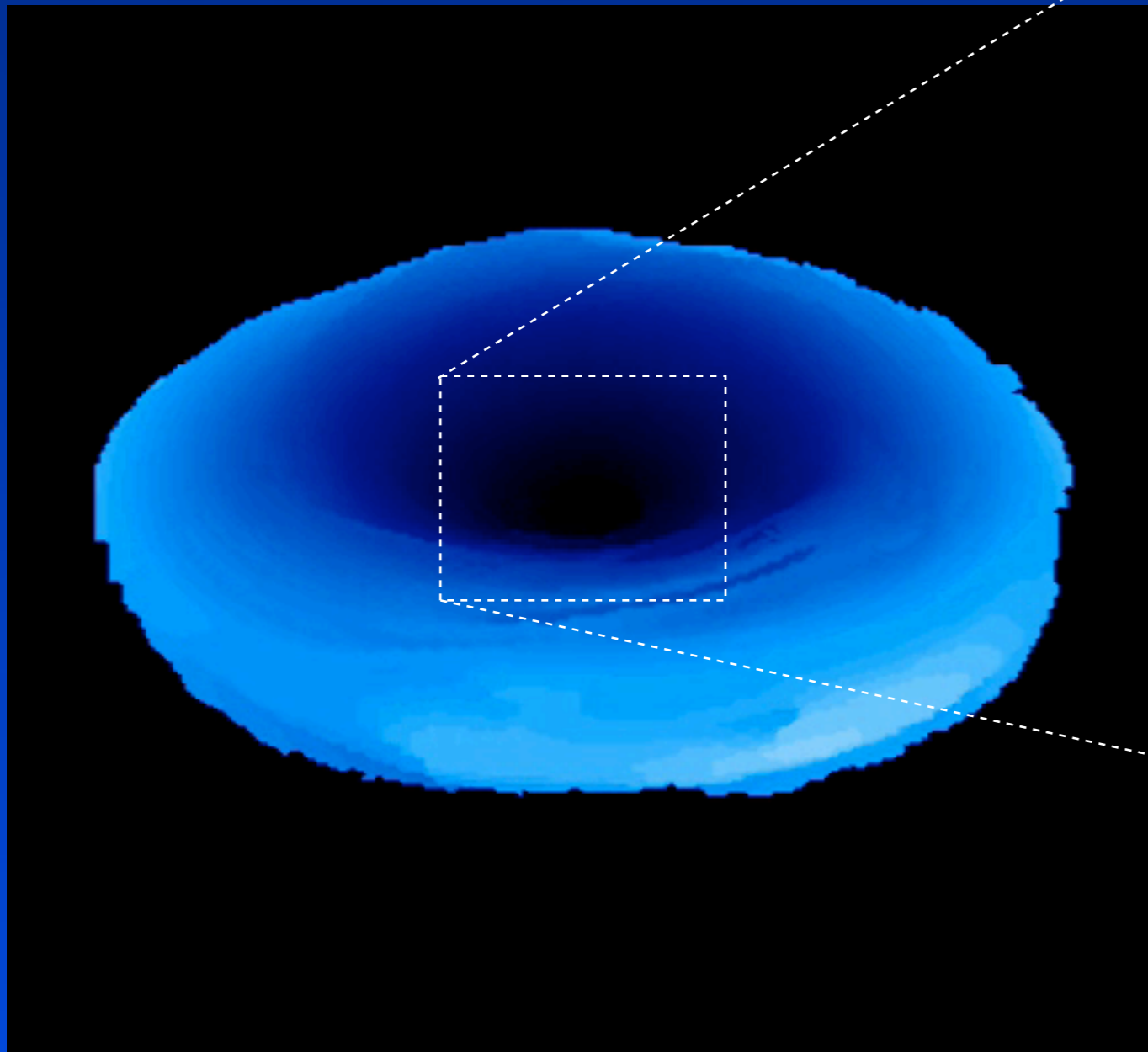
GRMHD + dynamical spacetime

- Add time-dependent (a, M) to code
- Add correct treatment of Einstein equations

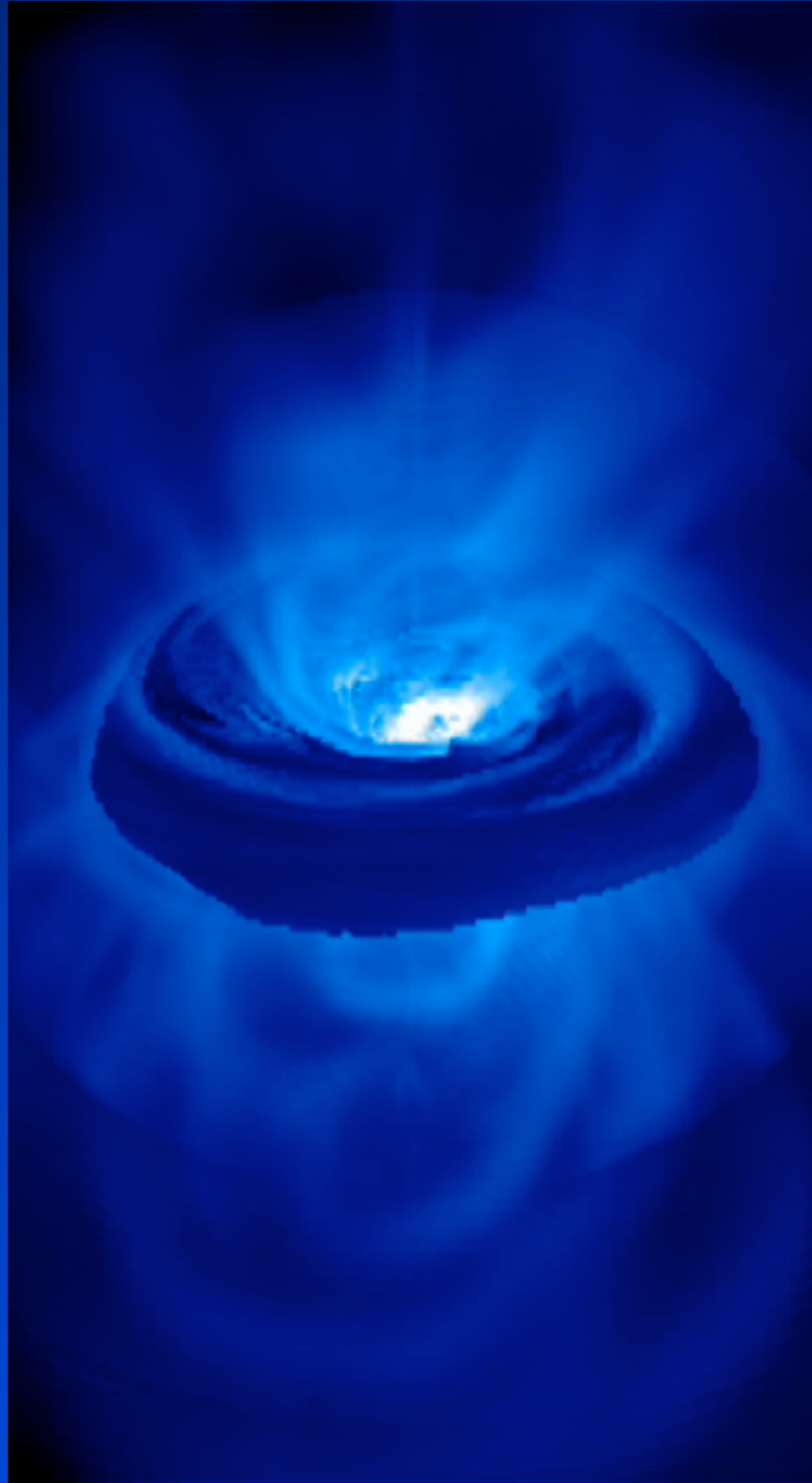
GRMHD + radiation

- Post-processing with ray tracer
- Add correct treatment of radiation

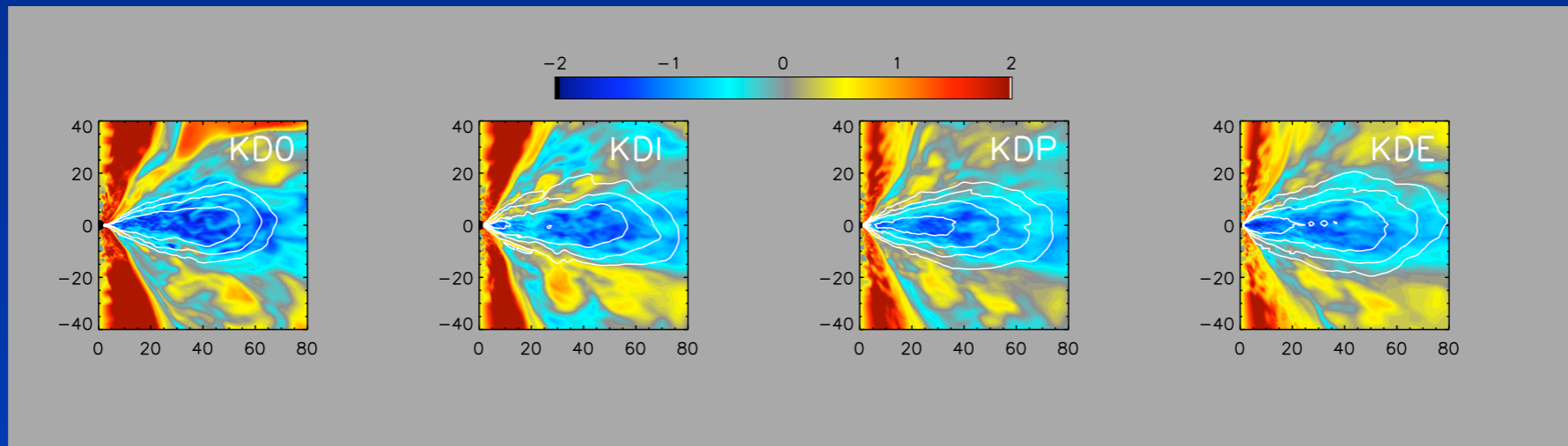
SF Torus - Ray Trace



SF Torus - Ray Trace



KD Tori



SF Torus

