

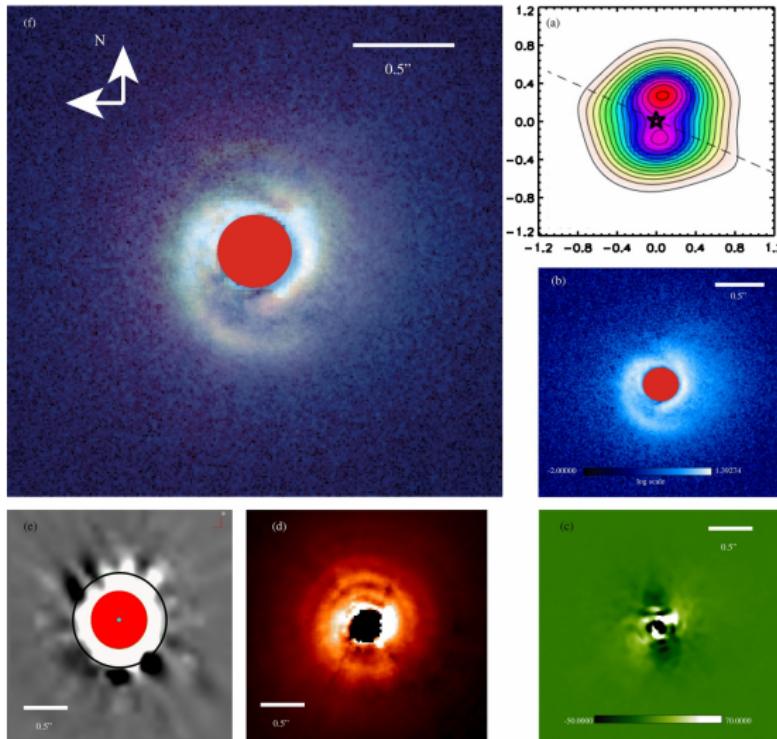
Instabilities in protoplanetary disks and its role in planet formation

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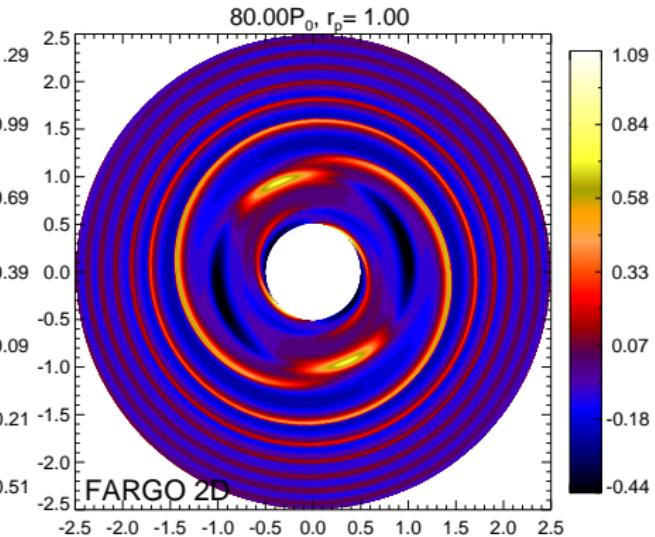
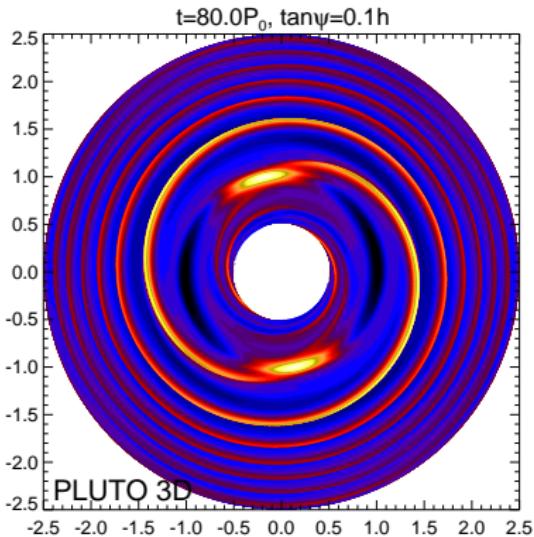
Sub-structures in protoplanetary disks



(Grady et al. 2013)

Large-scale hydrodynamic instabilities

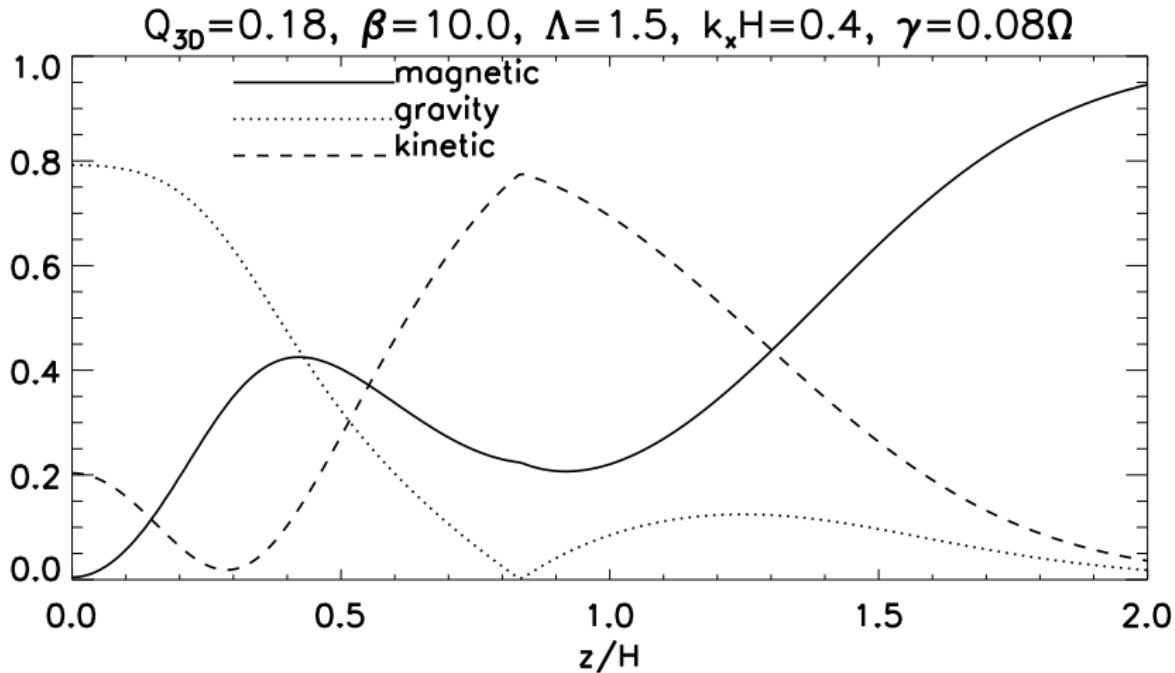
Gravitational instability of dead zone boundaries



Astrophysical fluid codes: FARGO, ZEUS, PLUTO , (ATHENA)

Linear hydrodynamics

Resistive magneto-rotational instability in massive disks



(Lin and Menou, in prep.)