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# Magnetorotational turbulence, dynamo action and transport in convective disks

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We present a numerical study of turbulence and dynamo action in stratified shearing boxes with zero mean magnetic flux. We assume that the fluid obeys the perfect gas law and has finite (constant) thermal diffusivity. We identify two regimes. The first is a conductive regime in which the heat is transported mostly by conduction and the density decreases with height. In the limit of large thermal diffusivity this regime resembles the more familiar isothermal case. The second is the convective regime, observed at smaller values of the thermal diffusivity, in which the layer becomes unstable to overturning motions, the heat is carried mostly by advection, and the density becomes nearly constant throughout the layer. In this latter constant-density regime we observe evidence for large-scale dynamo action leading to a substantial increase in transport efficiency relative to the conductive case.
We then present an approach to deriving global properties of accretion disks from the knowledge of local solutions derived from numerical simulations based on the shearing box approximation. In this way we can discuss the consistency of the convective solutions.

## Contribution

Talk

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