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Thermodynamics, Vertical Structure, and Coronal Power of Optically-Thick MRI-Turbulent Accretion Disks[1] DMITRI UZDENSKY, Princeton Univ./CMSO — Determining the thermal structure of an accretion disk heated by the dissipation of MRI turbulence, and the fraction of accretion power released in the disk corona are two critical problems in plasma astrophysics. In this contribution, these two intertwined problems are considered in the case of a disk threaded by a weak vertical magnetic field. The vertical disk structure is calculated by balancing the local turbulent heating due to the disruption of MRI channel flows by parasitic instabilities, and the cooling by radiative diffusion. It is argued that, neglecting the effects of large-scale MHD disk dynamo, the MRI dissipation rate should be uniform across the disk, almost up to its photosphere. This enables one to obtain a self-consistent solution for the disk's thermal structure. Next, the efficiency of Parker instability, viewed as a secondary parasitic instability feeding off MRI channel flows, is assessed by comparing its growth rate with that of other parasitic instabilities. It is shown that Parker instability becomes important near the disk surface, leading to a certain minimal coronal power fraction.

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