

THERMOMAGNETIC INSTABILITY IN HOT DISKS

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A linear stability analysis of ionized disks with a temperature gradient and an external axial magnetic field is presented. It is shown that in addition to the familiar magnetorotational instability (MRI) the thermoelectric term in Ohm's law gives rise to pairs of circularly polarized Alfvén waves that become unstable if the temperature gradient is big enough so both hydro-magnetic and thermomagnetic effects can lead to the amplification of waves and make disks unstable. The regimes at which both the thermomagnetic instability (TMI) and MRI can operate are discussed. Of particular importance is the fact the growth rate is of the order of magnitude of the inverse rotation time and that its maximal value is in contrast to MRI achieved for wavelengths that are significantly shorter than the disks thickness.