

Hydrodynamics of decretion disks of rapidly rotating stars

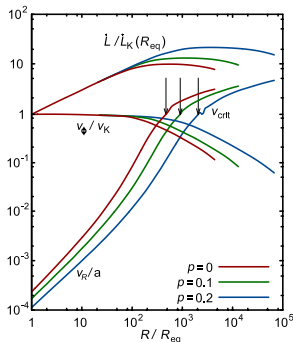
Petr Kurfürst

- Critical rotation angular frequency of star: $\Omega_{\text{crit}} = \sqrt{GM/R_{\text{eq}}^3}$.

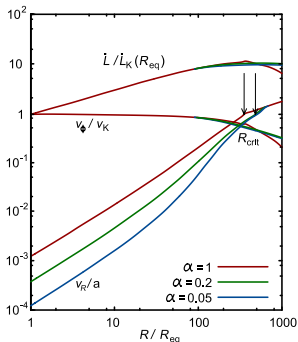
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- The radial dependence of selected physical quantities (Newton-Raphson method, Krtićka 2011):



The isothermal disk with various Shakura-Sunyaev α viscosity parameter, $T_0 = \frac{1}{2} T_{\text{eff}}$, $p = 0$.

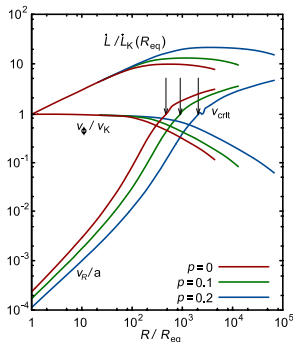


The same model for fixed viscosity parameter $\alpha = 0.1$ and for different temperature profiles.

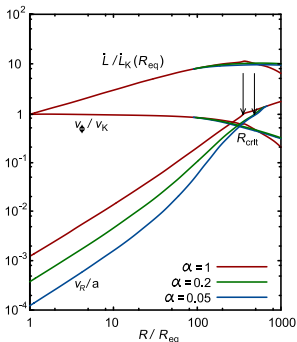
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- The rapid decrease of rotation velocity in supersonic region of the disk.
- Next step: modelling of the disk using different basic expression for viscous coupling.