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Radial dependences of physical parameters in α-disk as a consequence of two vertical structure solutions

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Abstract

We solve the vertical structure equations for a standard α-disk and compare the results with those obtained by an independent method (Ketsaris & Shakura 1998). On the basis of the numerical solutions for the vertical structure we obtain analytic radial dependences for the physical parameters of the disk. For a disk consisting of fully ionized hydrogen, its half-thickness is about 2.5 times larger than that obtained by the "standard" solution, averaging the vertical structure equations. Account of heavy elements leads to an additional increase of the half-thickness by approximately 25%.

Keywords

Accretion, Accretion disks