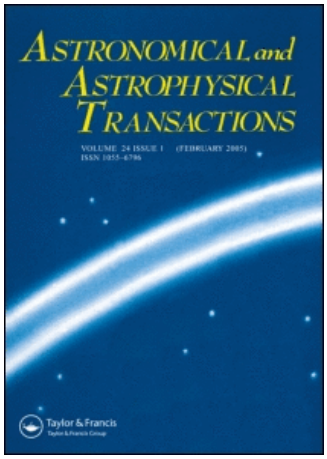

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MODELLING THE ATMOSPHERES OF ACCRETION DISKS

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The short results modelling of the accretion disks around white dwarfs and supermassive black holes are presented.

KEY WORDS quasars, white dwarfs, accretion.

The region where continuum emission is formed at the Rosseland optical depth $\tau_R < 100$ is called below the atmosphere of an accretion disk (AAD). We consider α-disks (Shakura and Sunyaev, 1973). We divide the disk into several rings and the atmosphere is considered separately for each ring. The total spectrum of the disk is a sum of rings' spectra, with the Doppler and Einstein shifts taken into account. The atmosphere of an individual ring is modelled using the code STARDISK based on Kurucz's code ATLAS5 (Kurucz, 1970).

We modelled AAD around white dwarfs (cataclysmic variable stars) and supermassive black holes (quasars and active galactic nuclei). Our main conclusion are as follows.

1. The local (for a given radius) AAD around white dwarfs differ only slightly from stellar atmospheres with the same $T_{\rm eff}$ and $\lg g$ at the surface, if the role of the corona is neglected (Suleymanov, 1992a).

2. An AAD of high luminosity ($L > 0.5 L_{\rm Edd}$) around a super-massive black hole with $\alpha \sim 1$ may differ strongly from a stellar atmosphere:

a) There are additional solutions with high temperature ($T_e \sim 10^{6-7}$ K) at low $T_{\rm eff}$($\sim 10^{4-5}$ K) (Suleymanov, 1991).

b) The disk may be effectively optically thin because it has low density, that is $\tau_{\rm eff}\sqrt{\tau_e \tau_{f-f,b-f,b-b}} < 1$, with $\tau_e \gg 1$, and the disk spectrum may have many lines and continuums in emission, in particular the Balmer and Paschen ones (Suleymanov, 1992b).

c) Strong wind from the surface of the disk should exist because the radiation force due to the resonance lines exceeds the gravitation force by two orders of magnitude for $\tau_R < 10^{-2}$ (Suleymanov, 1992b).

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