Title: ON THE POSSIBILITIES OF SHOCKS IN RELATIVISTIC ACCRETION AND WIND FLOWS.

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Abstract: In the present study, we investigate the possibilities of shocks in the accretion/wind flows. For the constant ultra-relativistic adiabatic index (Cp/Cv= γ = 4/3), shocks are possible because of the presence of the two saddle type sonic points in the flow. However, in the case accretion flows matter remains cool (non-relativistic i.e., γ = 5/3) at the outer boundary and becomes very hot (extreme relativistic and γ = 4/3) at the inner edge, the smooth variation of γ from 5/3 to 4/3 (outer to inner) needs to be taken into account while solving the hydrodynamic equations. In our recent study, we find that except for the region very nearby the compact object, γ does not change significantly from its non-relativistic value (which was opposite to the previous study) and therefore, the EOS mostly remains non-relativistic in nature. Employing this relativistic equation of state(EOS) (Synge 1957) in which the adiabatic index varies (4/3 to 5/3) from the non relativistic to relativistic regime with temperature we notice that number of the saddle type sonic point reduces to one indicating that the formation of shocks in the flow becomes unlikely.