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Do plasma composition affect the accretion and jets associated with the compact objects?

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Ordinarily gas composition do not affect the solutions of hydrodynamic (or MHD) equations of motion until explicit radiative cooling is considered, since radiative cooling depends on the electron number density! Matter around compact objects are very hot and are fully ionized and naturally consists of ions and electrons. We show that for different fraction of ions, the enthalpy of the flow vary significantly even when the temperature is same. Direct consequence of which is that the flow solutions vary significantly with the composition. We show that jet solutions launched with the same injection parameters evolve differently for different composition. The effect is enhanced for flow in presence of gravity. In this talk we discuss the implications in details.

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