

Two-component modeling of the plasma- neutral interfaces: role of charge exchange

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Two-component gasdynamic model of the interaction of cold neutral gas with the surrounding hot plasma is presented. It is assumed in the model that a cloud consists of cold neutral gas of atomic hydrogen, plasma is quasineutral. Hydrogen atoms and plasma protons interact by the charge exchange process. The magnetic field and radiative processes are ignored in the model at present. The influence of heat conduction in plasma on the interaction of a cold cloud and a hot plasma is studied. Results of the model of a cloud interaction with a hot isothermal plasma allow to estimate the lifetime of interstellar clouds as well as the X-ray emission caused by the charge transfer between highly charged ions of plasma and neutral atoms.

The role of charge exchange in the formation of the plasma-neutral interface around the Sun (where the solar wind plasma interacts with interstellar neutral component) is briefly discussed as well.