



Plasma adiabatic lapse rate

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The plasma analog of an adiabatic lapse rate (or temperature variation with height) in atmospheric physics is obtained. A new source of plasma temperature gradient in a binary ion species mixture is found that is proportional to the concentration gradient and difference in average ionization states. Application to inertial-confinement-fusion implosions indicates a potentially strong effect in plastic (CH) ablaters that is not modeled with mainline (single-fluid) simulations. An associated plasma thermodiffusion coefficient is derived, and charge-state diffusion in a single-species plasma is also predicted.

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