Solar Wind - Cometary Interaction at the Ionopause and Associated Phenomena

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Solar wind - cometary interaction at the cometary ionopause (including the tail) is reviewed in the context of recent missions to comets Giacobini-Zinner and Halley. The role of various MHD instabilities is discussed. The apparent marginal instability of the ionopause of comet Giacobini-Zinner and the stability of the ionopause of comet Halley (for large wavelengths perturbations) are explained essentially in terms of the different solar wind conditions encountered by the two comets. Nonlinear evolution of the instability is discussed. Waves of large amplitude arising due to the instability may intermix the plasma and result in heating and particle acceleration. A number of the observed phenomena found a natural explanation in terms of this mechanism.