

Ion acoustic solitary waves and double layers in the solar wind

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Ion acoustic solitary wave in a plasma consisting of electrons and ions with an external magnetic field is reinvestigated using Sagdeev's potential method. Although the Sagdeev potential has a singularity, we can obtain another solitary wave solutions and shock type solitary waves by expanding the Sagdeev potential up to δn^4 near $n = 1$, where n is the ion number density. Since there coexist the kink type of solitary wave and the bell type ion acoustic solitary wave, the solitary wave solutions appear as linear combinations of their solutions in the solar wind observation. We compared our results with the observation of the Freja satellite obtained from Wu *et. al* [Phys. Plasmas 3, 2879(1996)]. Also it is shown that these solitary waves propagate with a subsonic speed.