The structure and dynamics of Harris-type current sheet

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Thin current sheets may occur in various space plasma environments, such as the Earth's magnetotail and magnetopause, and they are usually associated with dynamically explosive plasma phenomena. Studies of their structure and dynamics are important to the understanding of energy transfer and release processes occurring in solar-terrestrial interaction and magnetospheric substorm. In this talk an overview is presented of the structure of Harris type current sheet that has been widely used as an equilibrium structure for studying the dynamics of the magnetotail and magnetopause current layers for the last forty years since its first construction by Harris in 1960. In particular, general solutions for Harris-type current sheet are proposed that incorporates the standard Harris model as a special case. The Harris equilibrium structures are then examined for tearing-mode instabilities and the observational evidences for the existence of such instabilities in the Earth's magnetopause are shown.