

ANALOGY BETWEEN SOLAR FLARES AND AURORA

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Making an analogy between solar flares and magnetospheric substorms, we can conjecture that quasi-separatrix layer (QSL) reconnection may very well occur in the latter. Indeed, the geometry of the Earth magnetosphere can possibly make the appearance of real 3D null points impossible in the magneto-tail when it is stretched anti sunward. This does not preclude the development of Harris-type current sheet with a guide field in the tail, i.e. of 2D null points with an azimuthally guide field, as often reported in global models of the magnetosphere. But solar models teach us that the latter configurations can correspond to a hyperbolic flux tube (HFT), hence to QSLs when the system is viewed globally. assuming that substorms correspond, on large scales, to the formation of a fully 3D twisted flux rope rooted in the ionosphere (and not a 2D plasmoid), we can transpose the solar Cartesian 3D model of Démoulin et al. (1996) to the Earth spherical geometry, replacing the solar photosphere by the ionosphere and the solar corona by the magnetosphere.

solar flare, reconnection, magnetosphere