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Open flux in Saturn's magnetosphere

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Abstract

We characterise the interaction between the solar wind and Saturn's magnetosphere by evaluating the amount of 'open' magnetic flux connected to the solar wind. This is deduced using the poleward boundary of the main aurora, observed by HST, as a proxy for the open-closed field line boundary in the ionosphere. The maximum and minimum limits of open flux content are constrained, in addition to the typical change in flux between consecutive observations. Such changes are related to the balance between the creation of open flux at the dayside magnetopause and its loss via reconnection in the magnetotail. The results are compared to the typical amount of flux transported via the post-plasmoid plasma sheet in Saturn's magnetotail.