



Variations of solar wind parameters, Earth's magnetospheric size and geomagnetic activity between 1966 and 2018

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We use both solar wind observations and empirical magnetopause models to reconstruct time series of the magnetopause standoff distance for nearly five solar cycles. Since the average annual interplanetary magnetic field (IMF) B_z is about zero, the magnetopause standoff distance on this time scale depends mostly on the solar wind dynamic pressure. The annual IMF magnitude correlates well with the sunspot number (SSN) with a zero time lag, while the annual solar wind dynamic pressure correlates reasonably well with the SSN but with a 2-3 year time lag. The 11-year solar cycles in the dynamic pressure variations are superimposed on an increasing trend before 1991 and a decreasing trend between 1991 and 2009. The same trends occur in the SSN, IMF magnitude and magnetospheric geomagnetic activity indices while opposite trends are seen in the magnetospheric size. We select events with daily average Dst less than -50 nT, which correspond to magnetic storms, and study the dependence of the events distribution on solar wind parameters.