Erosion at geostationary orbit: a statistical study between 1996 – 2001

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On the basis of WIND and ACE observations of the solar wind and the in-terplanetary magnetic field (IMF), we present a statistical analysis of erosion at geostationary orbit throughout the years 1996–2001. We focus on the depression of the total geostationary magnetic field strength as observed by the GOES 8, 9, and 10 spacecraft. Our data set consists of 288 measurements in an IMF Bz range between - 16 and 0 nT and a dynamic pressure range from 0 to 6 nPa. To be able to point out the erosion for each event, we apply a correction for effects of dynamic pressure. We do this by studying days with various dynamic pressure values but low IMF clock angles, θ (< 45º) to exclude dayside reconnection to a reasonable degree. For the erosion at geostationary orbit, we find ΔB_{tot} [nT] = - 3,58+1,67B_z with a correlation coefficient of 0.59. This analysis is most reliable in giving the change of the geostationary field to a decrease in IMF B_z, for which we obtain $\Delta B_{tot}=B_z$ = - 1.67 nT per 1 nT decrease in B_z.