Differential responses of the magnetospheric magnetic field to changes of various solar wind parameters

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Several tens of thousand satellite measurements at distances from 3 to 40 R_E have been used for studying the magnetic response to variation of different solar wind parameters. The response to increasing solar wind density manifests itself as the magnetic field compression. The velocity enhancement leads to the magnetic depression at distances <10 R_E. The IMF *x* component does not affect practically the magnetospheric magnetic field. About 50-100% of the IMF *y* component penetrates into the near-equatorial part of the magnetosphere. About 100% of the IMF *z* component penetrates into the dayside magnetosphere.