Some geophysical phenomena caused by solar wind sudden magnetic impulse

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Using auroral TV, magnetic pulsations data, VLF recordings at Spitsbergen and Lovozero, multisatellite observations, ground-based effects of the sudden impulse in interplanetary magnetic field were studied:
1.It was found, that during magnetic impulse (MI) effect sometimes sharp and isolated activisation of VLF emissions definitely lead magnetic pulsations for several minutes. Probably, these detected on the ground VLF emissions were generated during solar wind irregularities contact with magnetopause. If it is so, we have a simple method for direct estimation of the time of interplanetary magnetic field penetration inside magnetosphere. Because the time of VLF propagation from magnetopause to the ground is rather small (not more, than several seconds), we can measure the propagation time as a difference between moments of VLF and magnetic pulsations intensifications.
2.Shumann ionospheric resonance (and Alfven resonance as well) can be an indicators of the ionospheric response on sudden magnetic impulse. It was found that Shumann resonance intensity starts to increase after MI and reached maximum amplitude after 3-4 hours after MI. Frequency of the Shumann resonance maximum is also changed (from 7.8 to 8.2 Hz and back) not completely synchronously at Lovozero and Barensburg. That type of effects was not noticed during "normal", not MI-event triggered breakup.