Morning ionospheric disturbances in the high latitude triggered by the impact of the front edge of the magnetic cloud on January 10, 1997

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The interaction of the interplanetary magnetic cloud with the Earth's magnetosphere on January 10, 1997 led to the strong disturbances in the high latitude ionosphere. Using the ground Scandinavian network of ~30 MHz riometers and the IMAGE magnetometers we have found that on the front edge of this magnetic cloud there were observed simultaneous burst of the 1-3 mHz pulsations of ionosphere riometer absorption and geomagnetic field. The strongest intensity of these pulsations was observed at geomagnetic latitude near 74 which corresponded to location of the open/closed magnetosphere boundary. Contrary to Alfven field line resonance waves, these morning pulsations propagated eastward at ~6-7 km/s and were accompanied the green (557,7 nm) optical emissions. The sudden drop of solar wind dynamic pressure led to suppression of these pulsations. We speculate that the considered high latitude magnetic pulsations probably exited in the ionosphere in area of enhanced ionosphere conductivity due to the pulsating electrons precipitation.