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The large-scale ionospheric transient current system response to upstream solar wind IMF Bz north-south and south-north turnings as seen by the WIND satellite and the full SuperMAG network of ground based magnetometers

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We characterise the response of the quiet-time (no substorms or storms) large scale ionospheric convection system to north-south and south-north IMF turnings by using a dynamical network of ground-based magnetometers. Canonical correlation between all pairs of SuperMAG magnetometer stations in the northern hemisphere (MLat 50-82°) is used to establish the extent of near-simultaneous magnetic response between regions of MLT-MLat. Parameters and maps that describe spatial-temporal correlation are used to characterise the system and its response to the turnings aggregated over several hundred events. We find that regions that experience large increases in correlation post-turning coincide with typical locations of a two cell convection system and are influenced by the IMF B_y. The time between the turnings reaching the magnetopause and a network response is found to be ∼8-10 minutes and correlation in the dayside occurs 2-8 mins before that in the nightside.