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The latitudinal distribution of the baseline geomagnetic field during the March 17, 2015 geomagnetic storm

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Geomagnetic storms (GS) are global geomagnetic disturbances that result from the interaction between magnetized plasma that propagates from the Sun and plasma and magnetic fields in the near-Earth space plasma environment. The Dst (Disturbance Storm Time) global Ring Current index is still taken to be the definitive representation for geomagnetic storm and is used widely by researcher. Recent in situ measurements by satellites passing through the ring-current region (i.e. Van Allen probes) and computations with magnetospheric field models showed that there are many other field contributions on the geomagnetic storming time variations at middle and low latitudes. Appling the Empirical Mode Decomposition [Huang et al., 1998] to magnetospheric and ground observations, we detect the different magnetic field contributions during a GS and introduce the concepts of modulated baseline and fluctuations of the geomagnetic field. In this work, we apply this method to study the latitudinal distribution of the baseline geomagnetic field during the St. Patrick's Day Geomagnetic Storm 2015 in order to detect physical informations concerning the differences between high-latitude and equatorial ground measurements.