Relationship between polar cap potential and MLT distribution of ground delta H during geomagnetic storms using observations and RAM-SCB simulations

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The hourly Dst index and the equivalent 1-min SYM-H index values derived from low-latitude magnetic observations are considered to represent the intensity of the magnetospheric ring current. However, due to limited number of stations used in the calculation, these indices are not enough to capture the spatial/longitudinal variation of ring current. Therefore 30 low to mid latitude (9-45º CGM lat) magnetic stations are used to calculate **Delta** H_m. In addition to building the ring currents, the incoming solar wind energy is also used to influence further disturbance processes such as polar and auroral magnetic substorm activity. Polar Cap (PC) indices is a good proxy of the polar cap potential. Therefore, it is expected that ring current intensities have close relationship with polar cap indices. Some studies have shown relationship between Sym/Asym H with PC indices. However, the MLT distribution of ground Delta H_{asy} (Delta H_{asy} = Delta H - Delta H_m) that represent ring current asymmetry and its relation to the polar cap potential is not explored. In this study, we will examine the relationship between ground Delta H_{asy} and polar cap potential during selected geomagnetic storms. In order to see the magnetospheric origin, RAM-SCB simulations will be used to compare the ring current pressure distribution during these events.

