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## **The latitudinal and interhemispheric variations of the ionospheric M2 perturbations during the 2009 SSW in the American and eastern Asia-Australia sectors**

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The ionosphere exhibits enhanced semi-diurnal lunitidal (M2) perturbations during sudden stratospheric warming (SSW) events, of which the manifestation and mechanism are not well documented and understood. We studied the latitudinal and interhemispheric variations of the ionospheric M2 perturbations during the 2009 SSW with total electron content (TEC) data in the American and eastern Asia-Australia sectors. Results show that the M2 perturbations in the two sectors all enhanced during the SSW. The largest M2 amplitudes in the Northern and Southern Hemispheres appear at about 15°N and 20°S geomagnetic latitudes, respectively, with stronger magnitude in the Northern Hemisphere. Also, M2 perturbations in the two sectors all extend to middle latitudes only in the Southern Hemisphere and show local maxima around 35~40°S geomagnetic latitudes. The similar latitudinal and interhemispheric variations of the low-latitude M2 perturbations in the two sectors indicate that such variations may be mainly caused by the meridional wind modulation on the equatorial plasma fountain. Meanwhile, the longitudinal differences are also noticeable. The TEC M2 amplitude in the American sector is obviously larger than that in the eastern Asia-Australia sector, especially in the southern middle latitude. The M2 perturbations in the American southern middle latitude may be influenced by the combined effect of the zonal wind and local positive magnetic declination in the Weddell Sea Anomaly region.