



SuperDARN observations of an unusually contracted ionospheric convection pattern during the recent deep solar minimum

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We present a long term study, from 1995 - 2011, of the latitude of the Heppner-Maynard Boundary (HMB) determined using the northern hemisphere SuperDARN radars. The HMB represents the equatorward extent of ionospheric convection. We find that the average latitude of the HMB at midnight is 61° magnetic latitude during the solar maximum of 2003, but it moves significantly poleward during solar minimum, averaging 64° latitude during 1996, and 68° during 2010. This poleward motion is observed despite the increasing number of low latitude radars built in recent years as part of the StormDARN network, and so is not an artefact of data coverage. We believe that the recent extreme solar minimum lead to an average HMB location that was further poleward than previous solar cycles. We also calculated the open-closed field line boundary (OCB) from auroral images during the years 2000-2002 and find that on average the HMB is located equatorward of the OCB by $\sim 6^\circ$. We suggest that the HMB may be a useful proxy for the OCB when global auroral images are not available.