

Interactive comment on “Geomagnetic activity related NO_x enhancements and polar surface air temperature variability in a chemistry climate model: modulation of the NAM index” by A. J. G. Baumgaertner et al.

Anonymous Referee #2

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My main comment on the original manuscript was related to statistics and the use of Student's T-test under the assumption that data points were independent.

The authors revised the text surrounding the description of their application of this statistical test, and the new material is seen in section 3.2 of the manuscript - in the print version it is near lines 15-19 on p. 30180. The authors have apparently not changed their procedure for applying the test but have inserted text to discuss the assumptions of the Student test - i.e. the interdependence or lack thereof of the data. They say that there is no physical reason to assume any year to year dependence and

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therefore use the test 'with N=number of data points'.

This is not quite what I meant when I reviewed the first manuscript - but it is better than before since it alerts the reader to the issue. The main problem is still that by 'independence' the statistician does not mean 'physical independence' but rather the independence in statistical terms - i.e. is the value in one point related to or, predictable from, another point. This applies both to temporally and spatially correlated data.

The statistical approach used by the authors is all right provided the data series for SAT and hi-low Ap (Fig 7) are not strongly trending series - could the authors perhaps insert one plot showing the two series against time - or just take a look for themselves - and comment on this issue in the text?

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 30171, 2010.