

***Interactive comment on* “Observation of a tidal effect on the Polar Jet Stream” by C. H. Best and R. Madrigali**

Anonymous Referee #4

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The paper aims to find evidence of an influence of the lunar gravitational pull on the jet stream. In order to prove a correlation between the lunar position and the jet stream, the authors calculate the horizontal (parallel to the earth's surface) component of the moon's gravitational force and compare its temporal variation to the Arctic Oscillation (AO) index. However the evidence provided in the paper is circumstantial and the statistical analysis not documented well enough to be reproducible.

I recommend to not publish this paper.

The most critical points in my view are:

1. The main argument rests on the comparison of the AO with the calculated 'tractional force'. It is not clear where the authors got the data for the AO time series and how it

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was derived. Additionally the plots derived from the calculation of the 'tractional force' as described in the supplement are not conclusive. The horizontal component (parallel to earth's surface) of the lunar gravitational force should have a maximum towards the border of the earth disc (as viewed from the moon) not a minimum as shown in Figure 1 of the supplement.

2. The authors fail to dismiss potential dependencies of the AO on the lunar phase or position other than the gravitational pull. E.g. ocean tidal influence on surface pressure (and therefore the AO).

3. The statistical techniques used are not adequate and not traceable. The visual comparison of two time series as presented in Fig. 1 and Fig. 2 does not provide conclusive evidence. The presented autocorrelation is not explained in any way and the values given in Fig. 3 seem to be too small to support a meaningful correlation.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 22701, 2015.

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