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Interactive comment on "The Arctic vortex in March 2011: a dynamical perspective" *by* M. M. Hurwitz et al.

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There are several lines of evidence in the published literature indicating that meteorological conditions over the North Pacific strongly influence Arctic stratospheric temperatures, and partly supporting these findings on the key role of North Pacific SSTs in March 2011. In (1), we have constructed composites of winter months characterized by a very large PSC volume and found that months with very a cold Arctic stratosphere were preceded (with a lag of one month) by a positive phase of the Western Pacific teleconnection pattern, characterized by a High anomaly over the North Pacific. That pattern exerted a stronger influence than ENSO, as also found here. Articles (2) and (3) provide a detailed analysis of the interaction of blocking highs over the North Pacific with the background planetary waves, that lead to a suppressed vertical wave flux and

a cooling of the Arctic stratosphere, through a quasi-linear interference.

None of the three papers above considered SSTs. They rather focused on tropospheric circulation anomalies, but it would be of great interest if the authors could establish such a linkage. It seems clear that meteorological and surface conditions over the North Pacific play an important role in modulating Arctic stratospheric temperatures.

(1) Orsolini, Y. J., A. Karpechko and G. Nikulin, Variability of the northern hemisphere polar stratospheric cloud potential: the role of North Pacific disturbances, Q. J. R. Meteor. Soc., 135:1020:1029, DOI: 10.1002/qj.409, 2009.

(2) Nishii, K., H. Nakamura, and Y.J. Orsolini, Cooling of the wintertime Arctic stratosphere induced by the Western Pacific teleconnection pattern, Geophys. Res. Lett., 37, L13805, doi:10.1029/2010GL043551, 2010.

(3) Nishii, K., H. Nakamura, and Y.J. Orsolini, Regional geographical dependence of blocking high contributions to the stratospheric variability through enhancement and suppression of upward planetary-wave propagation, in press, J. Climate, 2011.

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