

## ***Interactive comment on “The effects of global change upon United States air quality” by R. Gonzalez-Abraham et al.***

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**1. Lin et al (2012a, JGR) has demonstrated the impact of Asian pollution on high-ozone events in Western U.S. surface air, with implications for attaining a more stringent U.S. ozone air quality standard. You might want to add their findings to your literature review. Related to Asian influence, Lin et al (2014, Nature Geoscience) demonstrated the important role of climate variability and circulation changes on the long-range transport of Asian pollution across the North Pacific. The extent to which changes in atmospheric circulation under future climate scenarios as represented in your models affect variability in the long-range transport of Asian pollution towards the U.S. west coast? I think it**

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**would make your paper stronger if you can clearly discuss the above points.**

Lin, M., A. M. Fiore, L. W. Horowitz, O. R. Cooper, V. Naik, J. Holloway, B. J. Johnson, A. M. Middlebrook, S. J. Oltmans, I. B. Pollack, T. B. Ryerson, J. X. Warner, C. Wiedinmyer, J. Wilson, B. Wyman (2012a): Transport of Asian ozone pollution into surface air over the western United States in spring, *Journal of Geophysical Research*, 117, D00V07, 2012, doi:10.1029/2011JD016961

Lin, M., L.W. Horowitz, S. J. Oltmans, A. M. Fiore, Songmiao Fan (2014): Tropospheric ozone trends at Manna Loa Observatory tied to decadal climate variability, *Nature Geoscience*, 7, 136-143, doi:10.1038/NGEO2066.

**2. A few studies have noted strong stratospheric influence on western U.S. surface ozone during spring (Langford et al., 2009; Lin et al., 2012b; Langford et al., 2014). Other work has suggested the possible increase of ozone STE in a warming climate (e.g. Hegglin et al., Nature Geosci). You might want to discuss these papers in the Introduction and clarify how your modeling framework represents the stratosphere-to-troposphere ozone transport. If the STE is not represented in your model, you need to clearly state this limitation.**

Langford, A. O., Aikin, K. C., Eubank, C. S. Williams, E. J. Stratospheric contribution to high surface ozone in Colorado during springtime. *Geophys. Res. Lett.* 36, L12801 (2009).

Lin M., A. M. Fiore, O. R. Cooper, L. W. Horowitz, A. O. Langford, Hiram Levy II, B. J. Johnson, V. Naik, S. J. Oltmans, C. Senff (2012b): Springtime high surface ozone events over the western United States: Quantifying the role of stratospheric intrusions, *Journal of Geophysical Research*, 117, D00V22, doi:10.1029/2012JD018151

Langford, A.O., C.J. Senff, R.J. Alvarez II, J. Brioude, O.R. Cooper, J.S. Holloway, M.Y. Lin, R.D. Marchbanks, R.B. Pierce, S.P. Sandberg, A.M. Weickmann, E.J. Williams. An overview of the 2013 Las Vegas Ozone Study (LVOS): Impact of strato-

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spheric intrusions and long-range transport on surface air quality. *Atmos. Environ.*, doi:10.1016/j.atmosenv.2014.08.040, 2014

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