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# ***Interactive comment on “Injection heights of springtime biomass burning plumes over the Peninsular Southeast Asia and their impacts on pollutant long-range transport” by Y. Jian and T.-M. Fu***

**Anonymous Referee #2**

Received and published: 8 November 2013

## **Summary:**

This paper presents the first study of fire smoke heights retrieved from satellite observations in peninsular Southeast Asia. The Authors use MISR and MODIS data with the MINX software to derive an important dataset of smoke plumes in spring 2001–2010, and found that about 45% of the smoke stereo-height retrievals were injected into the free troposphere. The Authors use this result in combination with the GEOS-Chem model and TRACE-P aircraft observations to study the transport of fire pollution out of southeastern Asia in March 2001. The Authors conclude that direct

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injection of biomass burning emissions into the free troposphere was not important for long-range transport of CO. However, the initial injection height of biomass burning emissions had important implications for the long-range transport of BC and PAN, and the production of O<sub>3</sub> over downwind southern China and northwestern Pacific.

**General comments:**

The manuscript is of very good quality, well written and organized. In my opinion, the paper presents results that would be of interest to the readers of ACP and I consider this article adequate for publication, with some minor changes. Below, I have added some comments and editorial corrections which I hope the Authors consider in the revision of their manuscript.

**Specific comments:**

Section 2.2 line 172. Did the Authors include all the pixels in the analysis, including those in which the zero-wind and wind-corrected pixel differed in more than 1 km? If so please state.

Section 2.2 line 175. The horizontal and vertical resolutions for MINX stereo-height retrievals are 1.1 km and 275 m, respectively. Please, cite Nelson et al. (2013) for MINX: *Nelson, D.L.; Garay, M.J.; Kahn, R.A.; Dunst, B.A. Stereoscopic Height and Wind Retrievals for Aerosol Plumes with the MISR Interactive eXplorer (MINX). Remote Sens. 2013, 5, 4593-4628.*

Section 2.5 line 243. Please, define STP.

Section 3.1 line 270. Please, note if the height range from 0 to 6 km refers to above sea level or terrain.

Section 3.1 line 285. My understanding is that agricultural fires dominate over the peninsular Southeastern Asia. I am wondering why the Authors identified more fires over forests than croplands. Are forest fires easier to detect and retrieve with MINX than over croplands? If so, the Authors should clarify that point since their results may be biased towards forest smoke plumes, which typically reach higher altitudes than crop fire plumes.

Section 3.1 lines 288-291. The Authors state that smoke heights were higher over

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forests and savanna than over croplands. I am wondering if they analyzed MODIS fire radiative power provided within the MINX plume dataset to determine if forest fires were more energetic than croplads.

Section 4.2 line 427. Figures 5 "b-d".

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 23781, 2013.

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