Atmos. Chem. Phys. Discuss., 9, S325–S327, 2009
www.atmos-chem-phys-discuss.net/9/S325/2009/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Long term particle size distribution measurements at Mount Waliguan, a high-altitude site in inland China" *by* N. Kivekäs et al.

Anonymous Referee #1

Received and published: 21 February 2009

General comments

This paper describes variations of number size distribution and CN concentration at Mount Waliguan, China. They measured about one and half year with some long interruptions. This paper includes analysis of diurnal and seasonal variations and relation with air trajectory. However, the paper does not consider well about local setting of air circulation and adequately justify representativeness as an aerosol monitoring site. I feel that this site is a rural (?) inland place, rather than typical mountain site. This paper contains potentially useful data to show features of this kind of inland area, but description of the current manuscript is lacking new implication and conclusive findings. More

analysis and discussion will be needed to provide meaningful new results. Combined above with other points listed below, this paper needs more work to be published in ACP.

Specific comments

1 introduction The aim of this study is not clearly stated. To avoid local contamination, any rural site would be suitable to measure aerosols. Why do you use the mountain or high altitude site?

2 materials and methods 2.1 measurement site Topographic map should be included to show local settings about cities, relative height difference around this area, and local wind condition at this highland area. This site seems to be located at a hill in highland. Several papers on atmospheric chemistry at this site have been published (Tellus, 55B, 145-158, 2003; Wang, JGRD, 2005jd006527, 2006 etc). These papers discussing about local contamination might be useful to show site characteristics of local air situation. Combined figures of typical time variations for CN, water vapor, trace gas concentration, up wind velocity etc are also helpful to show local mixing situation.

2.2 instrumentation References for GAWSIS, FLEXTRA trajectories are needed.

2.3 data processing Provide details of data screening. How long does one scan take? Describe reasons to categorize size distribution and provide more about criteria for separating distribution type. For comparative purpose to other place, modal parameters would be suitable instead of subjective type separation used here. What is starting height for air trajectory?

3. Results 3.2 comparison to other measurements I feel that this site is a place of rural (?) highland because of absence of clear mountain-valley winds and high CN concentration. Rather than mountain site, comparison with Siberian data (such as Koutsenogii & Jaenicke, JAS, 25, 377-383, 1994; Paris et al., AE, 43, 1302-1309, 2009 etc) seems to be more suitable, as compared to Indian sites in this paper.

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3.3 temporal variation As mentioned in this section (lower part of P2061 and upper part of P2062), time variation of water vapor at this site seems to suggest diurnal mixing "within" PBL not for mixing between free-troposphere and PBL, probably because altitude difference of 600 m from the surrounding highland is not enough to climb up thick PBL at this area. More work will be needed to characterize aerosol data in relation with diurnal variation of PBL structure at this site.

3.4 trajectory analysis Although trajectory analysis is presented, there is no conclusive finding.

Technical corrections

P2066 Brasseur et al, wrong title

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 2049, 2009.