

## ***Interactive comment on “Comprehensive airborne characterization of aerosol from a major bovine source” by A. Sorooshian et al.***

**M. Kleeman (Referee)**

mjkleeman@ucdavis.edu

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Title: Comprehensive airborne characterization of aerosol from a major bovine source  
Author(s): A. Sorooshian, S. Murphy, S. Hersey, H. Gates, L. Padro, A. Nenes, F. Brechtel, H. Jonsson, R. Flagan, and J. Seinfeld

This manuscript describes the characterization of a bovine plume in the San Joaquin Valley of California using aircraft measurements including a PILS and cTOF-AMS. The result emphasized most strongly in the paper is the apparent detection of amines in the particles acting to neutralize at least 14–23% of the acidic PM species. This finding would be a major improvement in our understanding of the chemistry of airborne particles downwind of major agricultural areas. The measurements and methods described in the paper are state-of-the-science, but I would still like to suggest future

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QA/QC measures that could be employed in future measurements designed to verify the current findings.

Detailed comments:

1. The PILS includes upstream denuders to remove acidic and basic gases from the sample stream so that they do not contaminate the PM measurements. Under normal sampling conditions these denuders have been shown to work quite well. Unfortunately, the plume that is the topic of the current study is anything but normal. Gas-phase concentrations of ammonia and amines can be expected to be many times larger than normal, raising the possibility that some material broke through the denuder. It might be the case that the authors have the data to evaluate this potential problem. I would urge them to highlight this quality control metric in the manuscript.

2. The aerosol concentrations measured in the current study are quite modest compared to the measured PM<sub>2.5</sub> concentrations that occur during winter stagnation events. PM<sub>2.5</sub> concentrations exceeding 100 ug/m<sup>3</sup> were measured widely throughout the San Joaquin Valley during the CRPAQS field study (winter 2000-01). Gas-phase measurements of ammonia and nitric acid were made during that campaign, confirming the hypothesis that a great excess of ammonia exists over nitric acid during winter stagnation events. That doesn't mean that amines didn't neutralize 14-23% of the acidic PM during the current modest campaign, but it does suggest that caution should be used when extrapolating the current results to a more severe pollution event.

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