**Atmospheric
Chemistry
and Physics
Discussions**

Interactive comment on "Optical closure experiments for biomass smoke aerosols" *by* L. E. Mack et al.

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This article presents very important experiments and interesting results in studying the optical properties of biomass smoke aerosols of different types of fuels. This article undoubtedly is suitable for being published due to the significance of the experiments and the findings that is presented in this paper. However, some major comments have to be addressed. 1) Page 7477: The authors discuss the correction factor 0.884 due to particle losses. This is not clear; do the losses occur in the sampling system or inside the instruments (PAS and Nephelometer)? If the authors mean that the losses occurred in the sampling system, that correction factor would be reasonable. However, it is not clear how that would affect the size distribution measurements. In addition, if the authors mean that losses occurred in the instruments, this factor seems very high.

The authors could test this issue by measuring the particles at the entrance and the exit of the instruments.

2) Table 2. The imaginary part of the refractive index of the organic carbon is taken as zero. This value needs to be checked since several studies suggested slight absorption for organic carbons from biomass burning.

3) Page 7477: The retrieval of the refractive indices: the authors present the routine for retrieving the complex refractive index using the bscat or babs measured by the Nephelometer and the PAS systems, respectively, including the calibration test of ammonium sulphate. In the calibration test, they included the babs measurements to retrieve the complex refractive index. The authors should clarify what the meaning of "including" is (e.g. is it just summing the basb and bscat so that ymeas=babs+bscat?).

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