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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Particle size distributions from laboratory-scale biomass fires using fast response instruments" *by* S. Hosseini et al.

Anonymous Referee #2

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The manuscript presents results of a test facility study focused on measurements of particle emissions from burning of different biomass fuels. Obtained particle size distributions (PSD) were measured using fast FMPS and APS particle counting instruments and then were analyzed with respect to burning conditions (modes). Authors suggest and discuss novel approach for data analysis and presentation which employ plots of modified combustion efficiency vs. geometric mean diameters of PSD and assessment of characteristic trends (slopes) observed in those plots. Presented data is novel and therefore can be considered as a subject for the ACP publication. The manuscript can be published after the authors will have chance to address a number of issues listed below.

Major issue: I second the point raised by the first reviewer that in its present form the

manuscript does not contain sufficient information about employed measurement techniques. Their fundamental concepts of operations need be presented and discussed in a context of presented data analysis and interpretation.

Minor comments: I think that Fig 9 could be presented with better clarity, if an entire PSD (not only mean size) would be plotted in a form of 3D plot, i.e. X-axis - MCE, Y-axis - Dp, Z- axis – color coded concentration of particles in different size bins.

Presentation of Fig 6 requires detailed discussion of differences in mobility and aerodynamic sizes, especially for flaming cases where fractal soot particles dominate emissions. Presentation and comparative discussion of combined (FMPS and APS) data for representative flaming and smoldering cases is suggested.

Perhaps, interpretation of the time dependent data shown in Figs 7 and 8 can be better assisted and emphasized if corresponding values of MCE were also presented as a function of time for emissions during those selected burns.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 8595, 2010.