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Interactive comment on "Changes of fatty acid aerosol hygroscopicity induced by ozonolysis under humid conditions" *by* O. Vesna et al.

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On pages 15657 and 15658, the authors reported the measured growth factor of the ozone processed and unprocessed oleic acid aerosol under different relative humidity. The authors also compared their findings with those reported by Asad et al. (2004) and Hung et al. (2005), which used much higher ozone concentrations in their experiments. Recently, we (Lee and Chan, 2007a) investigated the changes in the hygroscopicity of oleic acid particles after ozone exposure using an electrodynamic balance. We used ozone concentration ranged from 240 to 280 ppb, which is closer to ambient atmospheric conditions. Similar to the current study, we only observed small changes in hygroscopic growth of oleic acid particles after ozone exposure and there is a great discrepancy between our findings with those of Asad et al. (2004). Incorporating the

findings reported by Lee and Chan (2007a) would strengthen the discussions of the results.

On page 15658, the authors reported no increase in hygroscopic properties when arachidonic acid (C20:4) particles were exposed to ozone at low RH condition. We (Lee and Chan, 2007b) studied the changes in the hygroscopicity of polyunsaturated fatty acids, including linoleic acid (C18:2) and linolenic acid (C18:3), after ozone exposure (200-250 ppb for 20 hrs) at low RH condition using an electrodynamic balance. We found that the reaction products were more hygroscopic than their parent molecules, especially for the case of linolenic acid. Since arachidonic acid has one more C=C bond in their hydrocarbon skeleton than linolenic acid for ozone to attack, the hygroscopicity of arachidonic acid particles are expected to be enhanced even at dry condition. Would the authors comment on this issue?

Further, Lee and Chan (2007b) proposed that ozone-induced autoxidation, in addition to direct ozonolysis, is a plausible pathway in the reactions between ozone and linoleic acid and linolenic acid particles. According to the literature of lipid chemistry, arachidonic acid can also undergo autoxidation at ambient temperature and the rate of autoxidation depends on the number of C=C bond in the hydrocarbon chain (Porter et al. 1995). Would the authors comment on the likelihood of undergoing autoxidation in the arachidonic acid particles?

References:

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 15651, 2007.