Atmospheric
Chemistry
and Physics
Discussions

Interactive comment on "Light absorption of brown carbon aerosol in the PRD region of China" *by* J.-F. Yuan et al.

J.-F. Yuan et al.

huangxf@pku.edu.cn

Question: As authors suggested, in addition to BrC, size distribution, mixing state, and fractal dimension of BC particles can affect to the observed AAE values. Because all of the size distributions, mixing state, fractal dimension, and r_org/bc can vary depending on sources of BC, the effect of size distribution, mixing state, and fractal dimension on AAE value may depend on r_org/bc. In this case, the intercept values of the AAE vs. r_org/bc do not represent the typical AAE values for BC. I would like ask to consider this point.

REPLY: This point has been clarified in the revised text in section 3.2, as below: "It should be noted that previous studies showed that AAE of ambient aerosol can also

be influenced by a couple of other factors, such as size distribution, mixing state, and fractal dimension of BC particles (Levin et al., 2010; Gyawali et al., 2009; Scarnatol et al., 2013; Bond et al., 2006), but it is quite complicated and almost impossible to consider the influence of all these factors simultaneously. Scarnato et al. (2013) also pointed out that it is very difficult to clarify the relationship between AAE and aerosol morphology and mixing state due to quite complicated mechanisms in real cases. In this study, this issue was just simplified using a univariate regression analysis to explore the relationship between ambient AAE and organic aerosol. In result, the good correlations obtained in Fig. 2 indicated that BrC itself could be the dominant factor leading to the variation of AAE, and thus the extrapolated intercept was a good surrogate for AAE_BC. The influence of other factors could be partly reflected by the error bars of the data points in Fig. 2 and the estimated uncertainty of the intercept (i.e., UAAE_BC)."

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 28453, 2015.