

# ***Interactive comment on “Mixing State of Refractory Black Carbon of the North China Plain Regional Aerosol Combining a Single Particle Soot Photometer and a Volatility Tandem Differential Mobility Analyzer” by Yuxuan Zhang et al.***

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The authors used SP2 and VTDMA techniques to determine the mixing state of rBC and showed a number of interesting and important results for BC particles in the NCP region. I have a short comment.

For the size inversion by SP2 and the interpretation of internally-mixed BC particles, the authors made an important assumption that internally-mixed BC has a concentric core-shell structure, where the Mie theory can be applied. However, a number of recent studies (e.g., He et al., 2015, 2016; China et al., 2015) have shown that non-core-shell

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structures of coated/aged BC particles are ubiquitous and could significantly affect BC optical properties. Therefore, assuming a core-shell structure may introduce some uncertainties. It would be useful if the authors could include these recent references and add some discussions on this aspect.

#### References:

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