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Mixing states of black carbon and contributing aerosol components in Yangtze River Delta region in China.

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As one of the most polluted regions in China, East China is suffering from regional and mixed air pollution. Black carbon (BC) internally mixed with other aerosol components can aggravate regional air pollution through aerosol-radiation interactions. Optical properties of BC are largely affected by its mixing state and particle size distribution. However, dominant processes and components of BC coating, especially during different seasons or pollution events, have not been systematically described. In this study, one-year single particle BC measurement was conducted to firstly study the temporal variations of BC mixing states and size distribution. Moreover, machine learning was performed to analyze dominant aerosol components contributing to BC coating. Typical episodes were then selected to evaluate impacts of aging process on BC light absorption properties. Lagrangian modeling and chemical signature observed at the site were also analyzed to discuss the characteristics of BC-aging during pollution episodes.