

Ambient ozone control in a photochemically active region: short-term despiking or long-term attainment?

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China has made significant progress in decreasing ambient concentrations of most air pollutants, with ozone (O_3) an exception. O_3 mixing ratios during pollution episodes are far higher than its national standards, thus greater evidence-based control efforts are needed for O_3 attainment. By using a validated O_3 modeling system and the latest regional emission inventory, this study illustrates that control strategies in O_3 short-term despiking and long-term attainment might not be concerted in the Pearl River Delta (PRD), a photochemically active region in China with peak O_3 levels frequently exceeding the national standard. VOC-focused controls are more efficient in O_3 despiking at urban and industrial areas, but significant reductions on NO_x emissions and subsequent transition into NO_x -limited regime are required for O_3 attainment. By tracking O_3 changes along the entire path towards long-term attainment, this study suggests to put greater control efforts on NO_x emissions region-wide. Parallel VOCs controls around Nansha port area are necessary in the summertime and should be extended to the urban and industrial areas in fall and be strengthened during O_3 episodes. Contingency VOC-focused controls on top of regular NO_x -focused controls could hopefully achieve balance between short-term despiking and long-term attainment of O_3 pollution in the PRD.