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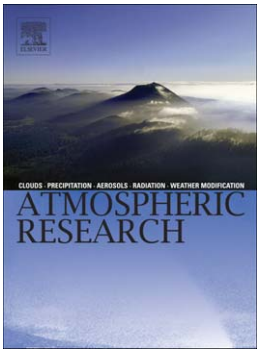

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Modeling study of surface ozone source-receptor relationships in East Asia

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Abstract:

Ozone source-receptor relationships over East Asia have been quantitatively investigated using a chemical transport model including an on-line tracer-tagged procedure, with a particular focus on the source regions of different daily ozone mixing ratios. Comparison with observations showed that the model reproduced surface ozone and tropospheric nitrogen dioxide column densities. Long-range transport from outside East Asia contributed the greatest fraction to annual surface ozone over remote regions, the Korean peninsula, and Japan, reaching 50%–80% of total ozone. Self-contributions accounted for 5%–20% ozone in the Korean peninsula and Japan, whereas the contribution of trans-boundary transport from photochemical production in China was less than 5%–10%. At extra-high ozone levels, self-contributions reached 50%–60% in the Korean peninsula. Ozone source-receptor relationships showed high seasonal variability over East Asia. Significant transport was also found between sub-regions in China, which presents a great challenge to

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