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## Model simulations of polar boundary layer ozone depletion events in spring

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In the last several decades, significant depletion of boundary layer ozone (ODEs) has been observed in both Antarctic and Arctic, especially over sea ice zones. ODEs are attributed to catalytic destruction by bromine radicals (Br and BrO), especially during bromine explosion events (BEs), when high concentrations of BrO periodically occur. However, neither the exact source of the bromine nor the mechanism of the formation of ODEs is completely understood. Here, by considering an additional bromine source from sea ice (through blowing snow events), we can successfully reproduce some of observed BEs in a 3D global transport model, pTOMCAT. Modelled tropospheric BrO compares well, in general, with the tropospheric BrO column retrieved from the GOME satellite instrument. Observed surface ozone data, e.g. at Halley, are also compared with the simulations to further validate the mechanism of bromine release and investigate the condition for surface ODEs. Cases with large BEs over Weddell Sea are chosen for specific comparison.

### Please list some keywords

Model ozone depletion bromine explosion blowing-snow

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