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Limb scatter ozone retrieval from 10 to 60 km using a multiplicative algebraic reconstruction technique

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Abstract. The OSIRIS instrument onboard the Odin spacecraft routinely measures vertical profiles of spectrally dispersed, limb scattered sunlight from the upper troposphere into the lower mesosphere. These measurements are used to retrieve the ozone number density vertical profile using the SaskMART Multiplicative Algebraic Reconstruction Technique, which is a one dimensional modification of an existing two-dimensional tomographic retrieval algorithm. The retrieved profile extends from the cloud top to 60 km. In the absence of clouds the retrieval extends down to 10 km. This technique allows for the consistent merging of the absorption information from radiance measurements at wavelengths in the Chappuis and the Hartley-Huggins bands at each iteration of the inversion. The effectiveness of the retrieval is demonstrated using a set of coincident SAGE II occultation measurements that show a mean bias of less than 2% from 18 to 53 km.

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