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Beyond ozone hole impacts: Seamless composition-climate interactions explored with ICON-ART

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The ICOsahedral Non-hydrostatic (ICON) modelling system was originally developed by DWD and MPI-M for a range of weather (forecast) and climate applications. An Aerosols and Reactive Tracers (ART) module was added by KIT to enable a comprehensive assessment of composition interactions within the atmospheric domain. Recognising that atmospheric processes happen on a multitude of temporal and spatial scales, flexible horizontal and vertical grid options are a key element of versatile model configurations in use. Here, we present a selection of results from different ICON-ART configurations that explore (stratospheric) ozone-climate interactions and stratosphere-troposphere coupling –e.g. regional climatic impacts of the ozone hole (and ozone losses in other regions) and global warming induced changes in jet-streams –in different types of integrations. In addition, we explore the potential to forecast "chemical weather"with ICON-ART, including environmental (UV) indices.

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