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Fast interactive ozone chemistry in ESMs: SWIFT

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SWIFT has been developed based on machine learning approaches to provide a fast interactive stratospheric ozone chemistry. It is developed as separate, easy-to-implement polar and extrapolar modules. Its polar component has been successfully implemented and tested in two atmospheric components of earth system models. Comparative experiments within the Polar Amplification Model Intercomparison Project with and without SWIFT enabled show a slightly improved polar vortex stability and variability with an otherwise consistent model performance. A way forward is to implement SWIFT in future model systems like ICON(-ART) to enable state-of-the-art large-ensemble model projections with comprehensive stratospheric processes included.

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