

Coupling sea salt emissions to whitecap & wave dynamics in ICON

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Introduction

Sea salt aerosol emissions are driven by breaking waves and whitecap formation at the ocean surface. The current parameterization in ICON-ART relies only on temperature-dependent formulations (e.g., Mårtensson et al., 2003), neglecting dynamic ocean surface processes. Coupling sea salt emissions to whitecap fraction and wave state can improve physical representation of emission fluxes, especially under high wind or storm conditions.

Research Question

How does incorporating whitecap and wave information affect sea salt aerosol emissions in ICON-ART?

Working plan

- Step 1: Review sea salt emission schemes dependent on wind speed, whitecap fraction, and wave state.
- Step 2: Select or adapt a parameterization for whitecap-dependent emissions
- Step 3: Implementation of the new emission scheme in ICON-ART.
- Step 4: Validation of the results, sensitivity analysis, writing of thesis

Requirements

- Motivation, self-organization, interest in learning and team work
- Programming: Fortran & Python (basic), shell & unix (basic)

