

Constraining the source of significant variation in orographic drag representation in NWP and climate models: a model intercomparison of mean and subgrid orographic fields

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The representation of orographic drag is a major source of uncertainty in NWP and climate prediction and varies greatly across operational models, as recently demonstrated in work undertaken as part of the WGNE drag project. The total orographic surface drag experienced at each model grid point is the sum of resolved and parameterized sub-grid scale contributions. The latter varies across models due to differences in the parameterization framework employed and how the scheme is tuned. However, regardless of parameterization choices, both the resolved and parameterized contributions rely on the source orographic dataset and how these data are processed to provide fields for the grid-box mean orography and the sub-grid orography to be fed into the parameterization scheme. The extent to which these fields differ across models is uncertain. Here we present preliminary results from a first model intercomparison of these fields and the processing methods employed. This intercomparison incorporates many of the major forecast centres worldwide, and is intended to shed light on the sources of the significant differences in drag representation across their operational models, and consequently to inform future model development.