A multi-diagnostic approach to cloud evaluation

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Most studies evaluating cloud in general circulation models present new diagnostic techniques or observational datasets, or apply a limited set of existing diagnostics to a number of models. In this study, we use a range of diagnostic techniques and observational datasets to provide a thorough evaluation of cloud, such as might be carried out during a model development process. The methodology is illustrated by analysing two configurations of the Met Office Unified Model - the currently operational configuration (Global Atmosphere 6, GA6), and the configuration which will underpin the UK's Earth System Model for CMIP6 (GA7).

By undertaking a more comprehensive analysis which includes compositing techniques, comparing against a set of quite different observational instruments and evaluating the model across a range of timescales, the risks of drawing the wrong conclusions due to compensating model errors are minimised and a more accurate overall picture of model performance can be drawn.