

# K-Scale towards km-scale global simulations

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The current generation of global numerical weather prediction models typically have horizontal grid spacing of ~10 km and parameterise deep convection. Recent advances and investments in high-performance super-computing capability has allowed exploration of global simulations at the kilometre grid-scale where deep convection is explicitly resolved. International research efforts in this area have shown significant improvements in the representation of mesoscale features and improvements in forecast skill. Much of this work has been focussed on specific intercomparison periods through the Dynamics of the Atmospheric general circulation modelled on non-hydrostatic domains (DYAMOND) research consortium. The K-Scale project at the UK Met Office has implemented the technical capability to run very large domain (and global) explicit convection simulations within the Met Office Unified Model. We have developed a unique model hierarchy including; 5 km resolution global simulations, a cyclic tropical domain (with no east-west boundaries), and continental-scale regional limited area models. Here we present our latest results, utilising the model hierarchy to explore the upscale impact of explicitly simulating mesoscale convective features on regional scale circulation.