Conference Talk/Poster Abstract
Title: Linear Properties of Numerical Schemes for the Shallow Water Equations
Authors: Christopher F. Eldred and David A. Randall

Abstract:
The shallow water equations provide a useful analogue of fully compressible Euler equations since they have similar conservation laws, many of the same types of waves and a similar (quasi-) balanced state. There has been extensive work exploring the linear properties (balanced states, stationary and propagating modes) of various schemes for the shallow water equations on uniform grids, but comparatively little work for nonuniform grids (especially in the case of finite difference and finite volume methods). The advantage of uniform grids is that an analytic solution is often possible. The disadvantage is that such grids are not necessarily representative of the actual grids used in dynamical cores on the sphere. Using the Shallow Water Testbed Framework (SWTF) built on top of Morphe, the balanced states, stationary modes and propagating modes of the linear shallow water versions of NICAM, TRiSK and UZIM are examined on both uniform planar grids (square, hexagonal) and quasi-uniform spherical grids (geodesic).