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Implementation of a Laplace transform filtering integration scheme in the shallow water equations

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A numerical time-integration scheme based on a modified inversion of the Laplace Transform (LT) is under development. It is designed to eliminate spurious high-frequency gravity-wave components from an atmospheric model, while faithfully simulating the significant low-frequency modes. The method is currently being tested with the STSWM shallow water model developed by NCAR and modified by the ICON group. We focus on the LT method's treatment of the Hough modes; in particular the Kelvin wave. Theoretical results suggest that this will be more accurately represented than by traditional semi-implicit schemes. We provide numerical evidence in support of this claim.