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**Spectral transform solutions to the shallow water test set.** (English) Zbl 0878.76059

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(From the authors' summary.) Solutions to the shallow water equations in spherical geometry are presented. The solutions have been generated using a conventional spectral transform technique combined with a semi-implicit time differencing scheme. For several of the test cases, closed-form solutions do not exist. For these cases, high-resolution numerical integrations of the spectral transform model are used to provide reference solutions against which alternative numerical schemes and lower resolution spectral transform solutions can be evaluated. The sensitivity of the high resolution numerical solutions, associated with temporal truncation, spatial truncation, and internal dissipation, are quantified in order to help bound their uncertainty.

Reviewer: [R.S.Anderssen \(Canberra\)](#)

**MSC:**

[76M25](#) Other numerical methods (fluid mechanics) (MSC2010)

[76B15](#) Water waves, gravity waves; dispersion and scattering, nonlinear interaction

[76U05](#) General theory of rotating fluids

[65M70](#) Spectral, collocation and related methods for initial value and initial-boundary value problems involving PDEs

Cited in **37** Documents

**Keywords:**

spherical geometry; semi-implicit time differencing scheme; temporal truncation; spatial truncation; internal dissipation

**Full Text:** [DOI](#)