Fourth order Robert-Asselin type time filter

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Abstract In this talk we present a framework for constructing higher-order Robert-Asselin type time filters with any pre-determined order of overall accuracy. Although higher-order methods may require more memory allocation, it is feasible to adopt them in most modest-sized atmospheric modes since the in-core memory in many computer system has been increased significantly during the last several years. Within this unified frame, we recall the RA and hoRA2(3) filters and in particular, we develop a fourth-order filter, hoRA4. We present the error and stability analysis of the hoRA4-filtered leapfrog scheme, and several numerical experiments which confirm the theoretical results.

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