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Planetary waves tracking

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ABSTRACT

The study of the properties of atmospheric planetary waves - e.g propagation and breaking - is crucial for understanding weather and climate. Persistent spell of anomalous weather are often observed in conjunction with pronounced and long lasting planetary wave packet. Although the skill of long range forecast (say beyond 10 days) is still pretty low, there are hints that pronounced planetary waves wave train episodes may bring in extra-predictability due to their inherent long space-time correlation. In terms of climate, planetary waves have a fundamental role for the meridional transport of energy and momentum. As a first step of our research project, here we want to present the first results of a tracking algorithm, based on the planetary wave envelope computation. Our algorithm allows for monitoring the main wave packet episodes by computing their statistical properties like origin, duration, ray path. These information may be used in future studies to define new diagnostic tools for climate models and to try substantiate the hypothesis that, in case of presence of pronounced wave packet, the predictability of large-scale atmospheric motion increases.