



Scale Dependend Investigations of the Dynamic State Index Concerning the QG-Theory

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The Dynamic State Index (DSI) indicates local deviations of the atmospheric flow field from a steady wind solution based on the primitive equations under adiabatic and inviscid conditions. We represent generalizations of the DSI for reduced models given by the quasi-geostrophic theory and the Rossby-model. By applying a Fourier transformation to the circumpolar geopotential height field we demonstrate the characteristic dipole structure of the DSI-field related to atmospheric waves.

Furthermore, by applying data of the COSMO-DE model of the German Weather Service (DWD), we compare the vertical profile of all three DSI-parameters concerning classes with and without precipitation. We work out that the relation to precipitation decreases with increasing approximation, but in all scales, it can be shown that the DSI is highly correlated to diabatic processes.