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Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

Chemistry Climate Model with interactive Ocean (EMAC-FUB - MPIOM): First results

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Long time-scale variations of the climate system may be induced by greenhouse gases and modulated by the interaction with the oceans which play a major role in timing the global warming and in shaping its geographical distribution. Atmosphere-ocean interactions impact atmospheric fluctuations near the surface which are communicated to the whole atmosphere especially via the tropical upwelling influencing the stratospheric circulation patterns. Changes in the stratospheric chemical composition of radiatively active gases lead to changes in stratospheric temperature distribution which subsequently influences the troposphere via the strength of the polar vortex. A chemistry climate model with an interactive ocean component (EMAC-FUB with MPIOM) is used to assess the role of the ocean in stratospheric dynamic changes due to changing greenhouse gases concentrations. A set of model simulations with and without the oceanic component and for different parameters such as increasing greenhouse gases is analysed. In order to address the role of an interactive ocean model coupled to the chemistry climate model on the stratosphere-troposphere system statistical analyses of the Eliassen-Palm-flux divergences and NAM index will be presented. Stratospheric Ozone concentration changes due to model setups with online and offline ocean modelling will be shown.