



## **Ensemble Sensitivity Analysis of the Blocking System over Russia in Summer 2010**

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In summer 2010, the weather conditions in the Euro-Russian sector were affected by a long-lasting atmospheric block which led to a heat wave in Russia and floods in Pakistan. Following previous studies describing the block's predictability, the present study aims to investigate uncertainties in the upper-level wave pattern and diabatic processes which were responsible for the block's forecast variability during its onset, mature and decay phases. With this aim, an ensemble sensitivity analysis (ESA) is performed for three medium-range THORPEX Interactive Grand Global Ensemble multimodel ensemble forecasts, one associated with each phase of the block's life-cycle. The ESA revealed that the block's predictability was influenced by forecast uncertainties in the general wave pattern and in the vertically integrated water vapor transport (IVT), used here as a proxy for diabatic processes. These uncertainties are associated with spatial shifts and intensity changes of synoptic waves and IVT during the whole life-cycle of the block. During the onset phase, specific features include an Atlantic precursor block and the occurrence of several cyclones. During the mature stage, the blocking ridge itself was highly predictable, while forecast uncertainties in the wave pattern and in IVT primarily were associated with uncertainties in the block's western flank. During the decay phase, the ESA signals were less intense but the forecast variability significantly depended on the transformation of the block into a high over low pattern. It can be concluded that ESA is suitable to investigate the block's forecast variability in multi-model ensembles.