



## **Assessment of Climate Change Indicators with the Interactive Visual Field Exploration Tool SimVis**

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With the development of various remote sensing techniques and global circulation models (GCMs) during the last decades, the atmospheric domains for detecting climate change have been considerably broadened. This allows the investigation of the Upper Troposphere-Lower Stratosphere (UTLS) region, known for its sensitivity to climate change, using a variety of data records. A novel approach for a first assessment of these large multi-dimensional climate data sets has become feasible only recently. The SimVis (*Simulation Visualization*) software tool, developed by the VRVis Research Center (Vienna, Austria), uses advanced 4D visualization techniques to gain information about and to explore large three-dimensional time-dependent fields. Non-trivial visualization approaches are applied to provide a responsive and useful interactive experience for the user. Several representative multi-decadal climate models and re-analysis data sets are used in this study to show the capability of SimVis to deal with climate data. The data is systematically explored to find the most sensitive climate change indicators among pre-defined potentially useful atmospheric parameters such as temperature, geopotential height of pressure levels, and refractivity. Our findings will be applied to RO (Radio Occultation) climatologies, which are produced at Wegener Center, University of Graz, and are known for their high accuracy in the UTLS region. We will present results showing the assessment of sensitive regions for various parameters, as well as a comparison of our findings to the outcome of usual statistical

trend detection methods.