Hans-Ertel-Research-Zentrum (HERZ)

Despite increasing horizontal resolution over the years due to increasing computational power, global climate models (GCMs) cannot explicitly represent all atmospheric processes. Processes, whose horizontal scale is smaller than the typical grid spacing of current GCMs (in the order of 100-200 km), need to be parameterized. Such parameterizations are at the source of large uncertainties for the simulation of present-day and future climates. Their limited skill both reflects the complexity of the system and our poor knowledge of the involved phenomena and scale interactions.
It is the overall goal of this project to gain a better understanding and ideally representation of sub-scale processes. The emphasis is set on boundary layer, cloud and convective processes. The latter are tightly interconnected, of key importance for climate simulations, and often poorly represented. To achieve our goals, our method involves the use of observations, simplified theoretical models, and large-eddy simulations with resolution O(10 m).