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Keynote: Making use of supplementary observations for the development of physical parameterizations

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The performance of numerical weather prediction (NWP) systems is typically evaluated using standard verification. While this is an essential procedure to ensure the quality of operational forecasts, it is equally important to harvest additional observations for the evaluation of simulations. These supplementary observations are needed to study the underlying physical processes in detail and to enable future development of physical parametrizations.

Hereby, a combination of more established observational products and new observations that have for example been collected during field campaigns can be very beneficial. The way is illustrated in which spatially dense observations collected during the FESSTVaL campaign in combination with Doppler LiDARs have been used to gain a deeper understanding of boundary-layer processes. Moreover, the role of drag processes during the Perdigao field campaign is depicted. In addition, the benefit of combinations of instruments to assess the performance of a model is shown. The range of ICON simulations thereby span scales from global nwp down to high-resolution hectometer-scale limited area setups.

Based on the comparison of the different models to observations for example insights are gained on the partitioning between liquid water and ice within modelled clouds, or the importance of the subgrid-scale orographic drag scheme, even at high resolutions, is demonstrated.

Presenter: SCHLEMMER, Linda (Deutscher Wetterdienst)