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NARVAL North – Remote Sensing of Postfrontal Convective Clouds and Precipitation over the North Atlantic with the Research Aircraft HALO

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The new German research aircraft HALO (High Altitude and Long Range Research Aircraft) became recently available for measurement flights in atmospheric research. It's capacity of measuring from a high altitude vertical profiles of all components of atmospheric water - like vapor, liquid and ice, in both cloud and precipitation forms, as well as the aerosol particles upon which cloud droplets form – makes it a unique research platform. The aircraft, equipped with advanced radiometers, radar and lidar technology, the HALO Microwave Package (HAMP), is an initiative by German climate and environmental research institutions and is operated by the German Aerospace Center (DLR).

One of the first major missions to exploit the capabilities of HALO was conducted for the NARVAL project (Next-generation Aircraft Remote-Sensing for Validation Studies) during January 2014. After studying subtropical clouds one month before in the first NARVAL phase, the interest of NARVAL North focused on the study of cold air convection and precipitation in the form of rain and snow. Based at Keflavik airport (Iceland), several flights were conducted to examine the specific small-scale precipitation structures behind the backsides of cold fronts over the North Atlantic. This should help to narrow the gap in the understanding of substantial differences between satellite observations and model calculations in such situations. First data analysis of these measurements indicate promising results.

The poster will describe the HALO instrument packages as well as the collected observations during the campaign and will present preliminary scientific findings.