EMS Annual Meeting Abstracts
Vol. 16, EMS2019-872, 2019


# Numerical experiment with the global model Arpege and the NH-model AROME for YOPP-SH

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A dedicated 4DVar configuration of the global model ARPEGE has been created for the Year Of Polar Prediction - Southern Hemisphere (YOPP-SH) period (15 November 2018 – 15 February 2019) with a horizontal resolution of 7.5 km and 105 vertical levels over the South Pole thanks to the variable mesh: ARPEGE-SH. This specific geometry has been derived from the operational ARPEGE-NWP, with the same vertical grid and stretching factor of 2.2, but with the stretched pole localised over Dome-C instead of over France. In addition, for 3 YOPP superSite: DomeC, Alexander Tower and Dumont d'Urville, the non-hydrostatic model AROME at 1.3km will be used in a dynamical adaptation from ARPEGE-SH to study the subgrid variability near the surface, and the stable boundary layer.

Some preliminary results and comparisons will be presented such as: added value of the ARPEGE-SH configuration for Antarctica compared to the ARPEGE NWP model stretched over France. Some YOPP super-site (Dome-C, Dumont d-Urville) will be used to evaluate and compared ARPEGE-SH and the high resolution model AROME. The question of the spatial representativity of the observations is always raised and the use of the high resolution model AROME over DomeC, flat and rather homogeneous surface, and around Dumont d'Urville, with orography, sea and ice and coastal contrasts can help to investigate this question.

The impact of the coupling with a 1D sea ice model will be shown for the AROME around Dumont d'Urville and in the ARPEGE-SH configuration.

The specific NetCdf output from the ARPEGE-SH model on the YOPPsuperSite in "YOPP format" and some 3D fields in GRIB are available on a ftp website and on the YOPP data portal.