Advancing the DYNAMICO-LMDZ atmospheric model to improve the simulation of the polar atmosphere

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LMDZ is the global atmospheric component of the IPSL-CM Earth System Model, actively and historically involved in the CMIP exercices. The physics of LMDZ was recently coupled with the DYNAMICO icosahedral dynamical core, which allows in particular for a more consistent treatment of the atmospheric dynamics at high latitudes. DYNAMICO-LMDZ is now involved in the AWACA and THINICE projects, which aims to improve the simulation of the past, present and future polar climates thanks to intensive observational campaigns in the Antarctic and Arctic. In this overview presentation, we show the recent setting-up of new limited-area configurations of DYNAMICO-LMDZ to evaluate the physical content of the model over the poles as well as some on-going work on the parameterization development. We will show recent advances in the simulation of katabatic winds, a new drifting-snow scheme, and improvements in the representation of boundary-layer mixed-phase clouds. Current challenges and prospects regarding the parameterization of supersaturation with respect to ice, the representation of snow-atmosphere interactions, the physics-dynamics coupling in katabatic flows, as well as the tuning of an Antarctic configuration of the model will also be briefly presented.