Project title: TerraDT‘s land ice digital twin component
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Abstract

To guide climate change adaptation and mitigation, reliable information on the regional and local impacts of climate change is needed. The Destination Earth (DestinE; https://destination-earth.eu/) flagship initiative of the European Commission responds to this need by developing Digital Twins (DTs) of the Earth. However, the reliability of the impact assessments of Climate DT depends on the underlying km-scale climate models, which fail to represent some key components of the Earth system. Within the TerraDT project (https://terradt.eu/), funded in the European Commission’s Horizon programme, we aim to enhance the DestinE infrastructure by developing a Digital Twin of the Earth system for the cryosphere, land surface and related interactions. TerraDT subscribes to the DestinE vision of building interoperable and interactive DTs, while pushing the resolution to km-scale, globally. TerraDT improves the descriptions of Earth system components in the DestinE climate models for land ice, sea ice, aerosols and land surface. This computing time proposal, specifically, aims at facilitating the first ever coupling of a state-of-the art land ice model (Elmer/Ice) to a km-scale climate model (ICON), one of the Climate DTs of DestinE. The ultimate aim is to better understand atmosphere-ocean-ice sheet interactions that contribute to present-day sea-level rise.