New Project Proposal for Computing Time on the Supercomputer Levante

Project title: TIPPECC (Tipping points Explained by Climate Change)
Long title: Climate change information for adapting to regional tipping points in southern Africa
Short title: TIPPing points Explained by Climate Change (TIPPECC)
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Allocation period: 01.07.2023-30.06.2023

Project funding: BMBF-funded project FKZ 01LG2049B, SASSCAL 2.0: TIPPECC **Principal Investigator:** Torsten Weber

1. Project overview

The TIPPECC project is a three-year project and funded by the BMBF SASSCAL 2.0 (FKZ 01LG2049B). TIPPECC is a direct response to the South African Development Community (SADC) Grand Challenge (SGC) call, which emphasizes that the southern African region faces major risks in the form of climate change induced tipping points. These may lead to the collapse of hydrological, agricultural and ecological systems with profound consequences for human wellbeing and biological diversity. The project will bring together a multidisciplinary research team from six institutions in South Africa, Botswana, Namibia, Zambia and Germany to respond to the challenge of generating climate services that can enhance the region's resilience to tipping point induced impacts. The project is funded from August 2022 to July 2025.

In GERICS, we are leading a work package on regional projections of future climate change (WP1). This WP will set the data foundation that is needed to derive the climate indicators for the analysis of climate impacts (WP2), regional tipping points (WP4) and the web-portal based climate services (WP3). For this purpose, we will make use of the already existing but growing CMIP6 archive of global projections of future climate change, as well as the regional climate projections of CORDEX and the new initiative CORDEX-CORE. We will be generating a new set of high-resolution regional climate change projections with the new coupled ocean-atmosphere RCMs CCAM (WITS-GCI) and ROM (GERICS-AWI) using CMIP6 data as forcing. In order to build up an ensemble of regional climate change projections, the RCMs CCAM and ROM will downscale selected CMIP6 projections to a spatial resolution of up to 8 km for a selected domain in southern Africa. This ensemble will be the first coupled ocean-atmosphere projections of future climate change ever obtained for the southern African region, and will include feedbacks between the Agulhas current and Benguela upwelling system and atmospheric circulation over southern Africa. The newly performed regional climate change projections will be stored at a public database and made available for other scientists from different sectors and SASSCAL projects. This dissemination will take place through the project's Climate Service Gateway (WP3).