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Development and application of climate models over Africa using the CHPC

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Climate models are valuable tools for understanding the intricacy of climate system, simulating past climate, and projecting future changes in climate. The models are increasingly being used to provide information for climate change mitigation and adaptation strategies. Yet, climate modelling is lagging behind in Africa because of the many challenges, including computational constraints. The climate models, which use a set of equations (derived from physical, chemical, biological laws) to replicate the climate systems, are usually computationally intensive. Operating them requires huge computer resources, which are not available in most climate research institutions in the Africa. However, the Climate System Analysis Group (CSAG, University of Cape Town) has been active in climate model development and application over Africa because of its access to the CSIR CHPC. The group also uses the facility for building human capacity in climate modelling. For example, using the CHPC, the group lead the development of an adaptive-grid global climate model (called CAM-EULAG), which has the capacity to increase its horizontal resolution locally over Africa. The model has been successfully applied to simulate West African climate, Southern African climate, and tropical cyclones over the South-West Indian Ocean. Three postgraduate students have been trained and graduated on the model. Apart from CAM-EULAG, the group also runs other models like RegCM, WRF, WRF-Chem, MPAS, SPEEDY, ECOCROP on the CHPC. This presentation will highlight some results from climate modelling activities in the group.

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