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The PISSARO project: subseasonal impact-based forecasts of the cyclonic activity in the South West Indian Ocean basin

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The PISSARO project focuses on atmospheric and oceanic forecasting at the subseasonal scale for applications over the South West Indian Ocean basin (SWIO). It is a collaborative academic research project, developed and conducted in partnership with stakeholders from Reunion and Seychelles and a panel of scientific experts in subseasonal forecasting. The aim of this project is to evaluate, improve and valorize subseasonal forecasting data. For this purpose, we mainly use the data archived into the the S2S (Subseasonal-to-Seasonal prediction project) data base in order to 1) evaluate the quality of subseasonal forecasts for tropical cyclones and weather patterns, and 2) develop forecast products suitable for potential users. This project focuses on the SWIO, which has been little studied by the S2S community until now. The different territories of the SWIO are subject to extreme events and a significant cyclonic activity. It is important to take into account the specificities of this region in order to improve their warning systems.

The ambition to deploy early warning tools cannot be achieved without discussions between potential users and S2S experts. The users specify the characteristics of the products to be developed so that they offer an asset for decision-making, and the experts assess the feasibility of these products. In the presentation, we will first discuss the importance of collaboration between the users and the experts within the project using two concrete actions: the animation of a monthly experimental forecasting briefing with operational forecasters and the participation in conferences in the humanitarian field. Then, we will present the subseasonal forecasting products which are under development for the anticipation of cyclonic risk at monthly scale in the SWIO basin. To address the urgency of the need of the disaster risk reduction, we first made a basic adaptation of already existing tropical cyclone occurrence probability and rainfall forecasting products into products interpretable by non-meteorological users.

We consider that a crucial information from the S2S data base to provide to users is the level of uncertainty. However, estimating the quality of S2S forecasts is not straightforward. It is actually difficult to match a forecasted cyclone to an actual observed cyclone, let alone detect a false alarm. To this end, we are working on the classification of S2S tropical cyclone trajectories with clustering

methods and we will show the first results. We aim to exploit the ensemble character of the subseasonal forecast for the development of future S2S-derived forecast products that would provide probabilities of scenarios of potential trajectories (based on these clusters).