Contribution ID: **127** Type: **Invited Talk**

The Impact and Benefits of Partnering for Operational Weather Forecast Continuity

Monday, 1 December 2025 13:30 (20 minutes)

The South African Weather Service (SAWS) operates under the SAWS Act (Act No. 8 of 2001), which mandates it to provide essential weather forecasts and warnings to safeguard lives and property. To meet this mandate, SAWS runs numerical weather prediction (NWP) models on its high-performance computing (HPC) system to simulate atmospheric processes.

The current NWP configurations generate high-resolution weather forecasts for the Southern African Development Community (SADC) region (with a 4.4 km grid spacing) and South Africa (1.5 km grid spacing). Both models are run concurrently four times daily, providing forecasts up to three days ahead. These outputs support weather-sensitive sectors and stakeholders, including aviation, marine services, and disaster management.

In November 2023, SAWS relocated its head office, necessitating the transfer of critical operational systems, including the HPC infrastructure. Central to the success was the collaboration with the Centre for High-Performance Computing (CHPC). The two entities have a long-standing Memorandum of Agreement (MoA) that grants SAWS near real-time access to computational resources and backup services in case of HPC failures. This redundancy allows SAWS to maintain a significant component of weather forecasting services with minimal disruptions. Once the HPC was disabled for transfer, a mirror of the SADC (4.4 km) configuration was activated immediately on CHPC's Lengau system. Months of meticulous planning, rigorous backup and failover testing, and continuous coordination between the teams ensured this smooth transition of NWP operations.

The effectiveness of this failover approach underscored the critical importance of resilient and redundant HPC resources in sustaining continuous forecasting operations. The seamless collaboration between SAWS and CHPC ensured uninterrupted service, emphasising the critical roles of high-performance computing and partnerships in delivering essential meteorological services across South Africa.

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Workshop Duration

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Session Classification: HPC Applications