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Session 9b: Designing and delivering seamless services continued

Title: SWIRL: real-time observations and nowcasting of wind information's from weather radar

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SWIRL (Synthetic Wind Information from Radar and Lidar) is an operational 3D wind retrieval technique that produces 3D grids (1km horizontally and 500m vertically) of the three wind components in severe weather using radar data from the Australian operational radar network. The 3D wind is retrieved for all Doppler radars in the network in situation of dual-Doppler (meaning an overlap between radars) but also in single-Doppler using the optical flow computed directly from the reflectivity field in precipitation and clear-air. We found that SWIRL results are within 1 m/s and 5 degrees for the wind magnitude and direction, respectively, compared to the wind profilers. Moreover, using the NWP (Numerical Weather Predication) models as guide for SWIRL, we present an assessment of the feasibility of extrapolating SWIRL winds close to the surface using NWP low-level wind profiles for wind farm application. The study used four key data sources to conduct verifications: ACCESS-C Sydney, AWS station data, wind-profiler data, and SWIRL radar winds data in the Sydney domain. We used low-level winds from NWP with SWIRL winds for precipitation, clear air, and boundary layer index separately into a Regression model to assess the possibility of extrapolating the wind information to the wind farm level of interest using the radar observations.