

# Dome C North radar, a new radar of the SuperDARN network.

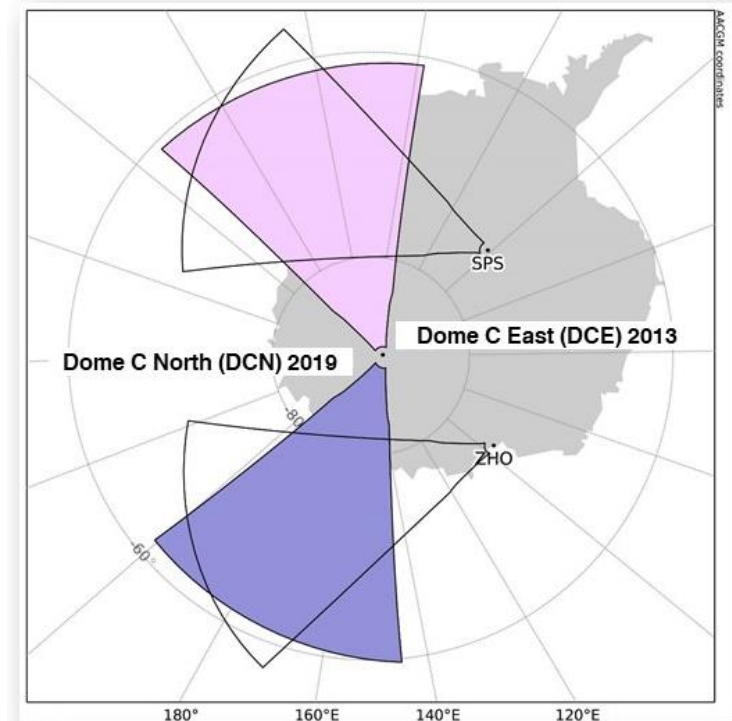
M.F. Marcucci<sup>1)</sup>, I. Coco<sup>2)</sup>, S. Massetti<sup>1)</sup>, S. Longo<sup>3)</sup>, D. Biondi<sup>1)</sup>, E. Simeoli<sup>4)</sup>, A. Cirioni<sup>3)</sup>, A. Satta<sup>5)</sup>, A. De Simone<sup>6)</sup>, A. Olivieri<sup>4)</sup>, A. Marchaudon<sup>7)</sup>

<sup>1)</sup>INAF-IAPS, Roma, Italy, <sup>2)</sup>INGV, Roma, Italy, <sup>3)</sup>CNR-DTA, Roma, Italy, <sup>4)</sup>CNR-ICT Department, Roma, Italy, <sup>5)</sup>CNR-IAS, Oristano, Italy, <sup>6)</sup>CNR-ISMN, Roma, Italy, <sup>7)</sup>IRAP, Toulouse, France

In January 2019 the new Super Dual Auroral Radar Network (SuperDARN) radar installed at the Concordia Station in Antarctica and denominated Dome C North (DCN) saw the first light. DCN and its companion radar Dome C East (DCE) are positioned nearby the southern geomagnetic pole with their Field of View extending towards the auroral latitudes. DCE and DCN permit to observe the effects produced in the ionosphere by the chain of phenomena taking place from the Sun to the Earth's space environment. DCE and DCN form a common-volume pair with the SuperDARN South Pole radar (U.S.) and Zhong Shang radar (China), respectively. The start date for data availability is January 29, 2019. The radar is performing well. The ionospheric echos vary according to the season, as expected, being influenced by propagation condition and therefore illumination. A statistical study shows that the echo occurrence rate can be at time rather high, e.g. during the ten days interval centered around the 2019 winter equinox, when the rate reaches more than 80% in the cusp region.

DCN radar, likewise DCE, is equipped with an auxiliary array of 4 receiving antennas that permits to compute the elevation angle of the backscatter signal. A preliminary analysis of the elevation angle data show that their quality is overall good.

The construction of Concordia radars was funded by PNRA and INAF from the Italian side and by IPEV and INSU from the French side. The radars operation are under the responsibility of INAF-IAPS and the radar maintenance is performed with the collaboration of the Italian National Research Council (CNR) and the financial support of PNRA.



Field of View of the Dome C East and Dome C North radars in Altitude Adjusted Geomagnetic Coordinates. Also shown the South Pole (US) and Zhong Shang (China) FoVs. (plot produced with Davit-Py\*)

\*Davit-Py has since been replaced by pyDARN

