



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 339

Type: Oral (Non-Student) / Orale (non-étudiant(e))

The many discoveries of the ICEBEAR-3D E-region coherent radar

Tuesday 10 June 2025 11:15 (15 minutes)

The Ionospheric Continuous-wave E-region Bistatic Experimental Auroral Radar (ICEBEAR) is a fully digital software defined radio (SDR) high-resolution 49.5 MHz VHF coherent E-region radar with an auroral zone field-of-view situated in western Canada (58N, 106W geographic). First light was in 2017, but in 2019 the final design of ICEBEAR was implemented with the re-configuration of the ICEBEAR receiver antenna array into a non-uniform co-planar T-shaped double interferometer layout. Applying highly advanced tailored aperture synthesis radar imaging techniques, radar echoes can be unambiguously located within the ICEBEAR-3D field-of-view with a nominal resolution of 1–3 km in 3-dimensions (range, azimuth, elevation). Both the scientific and technical research discoveries of ICEBEAR-3D have been many and varied, the former being highly enhanced by the highly advanced technical abilities of ICEBEAR-3D. This presentation will survey the many varied technical and scientific discoveries of this unique E-region coherent radar.

Keyword-1

E-region ionosphere

Keyword-2

coherent radar

Keyword-3

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Session Classification: (DASP) T1-2 Ionosphere, Thermosphere, and Radio Propagation | Ionosphère, thermosphère et propagation radioélectrique (DPAE)

Track Classification: Technical Sessions / Sessions techniques: Atmospheric and Space Physics / Physique atmosphérique et spatiale (DASP/DPAE)