Blainville weather radar (CASBV) performance during WINTRE-MIX

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WINTRE-MIX Meeting





Blainville – CASBV

- Leonardo, S-band
- 1 MW Klystron
- 9.2 m antenna, <0.9° beamwidth
- 17 top-down sweeps, every 6 minutes
 - Top 11 sweeps (24.4° to 3.6°):
 - ✓ Single PRF
 - ✓ 1° x 0.5 km
 - ✓ 11-12 seconds each \rightarrow 2.2 min
 - Bottom 6 sweeps (2.8° to 0.4°):
 - ✓ Dual PRF, alternating rays
 - ✓ 0.5° x 0.5 km
 - ✓ 33 seconds each → 3.3 min
- Owned and operated by the Meteorological Service of Canada, ECCC



Blainville, QC. Source: Wikimedia Commons

WINTRE-MIX Sites

- CASBV provided operationally acquired data → ODIM_H5 polar volumes
- No ability to modify data acquisition



Two complementary Z_{DR} monitoring methods

- 1. Returns from light rain (Ryzhkov, Gorgucci, others)
 - ✓Opportunistic no bird-bath scans
 - ✓Accounts for complete Tx and Rx chain
- 2. Solar signatures from operational moment data (Huuskonen, Holleman, Kurri, others)
 - ✓ Opportunistic not dedicated solar raster scans
 - ✓Only addresses Rx. Requires knowledge of calibration budget including Tx.
 - Also monitors power calibration (Z) and antenna pointing accuracy/stability

Monthly comparison – February 2022



Monthly comparison – March 2022



Light rain – February 2022



Light rain – March 2022



Light rain – Individual days







Summary analysis

- CASBV Z_{DR} is stable and near-zero during WINTRE-MIX
- Complementary monitoring methods confirm consistent radar performance
- Based on solar, CASBV runs a little "hot" relative to reference DRAO
- Pointing accuracy is within tolerance
- System ϕ_{DP} is around 36°