Operational polarimetric variables calibration at Météo France: where do we stand?

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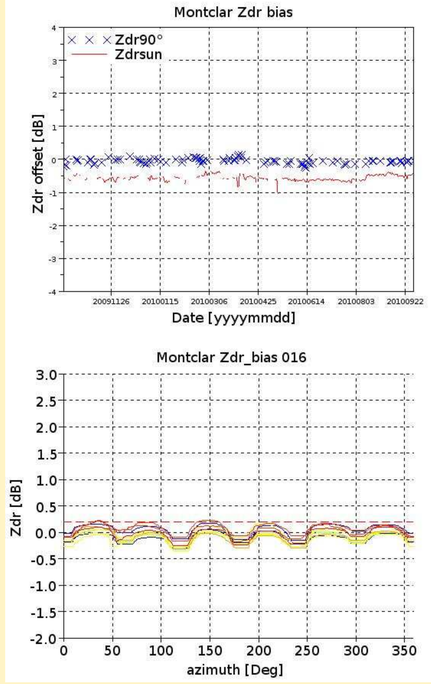
Calibration Techniques:

Zdr:

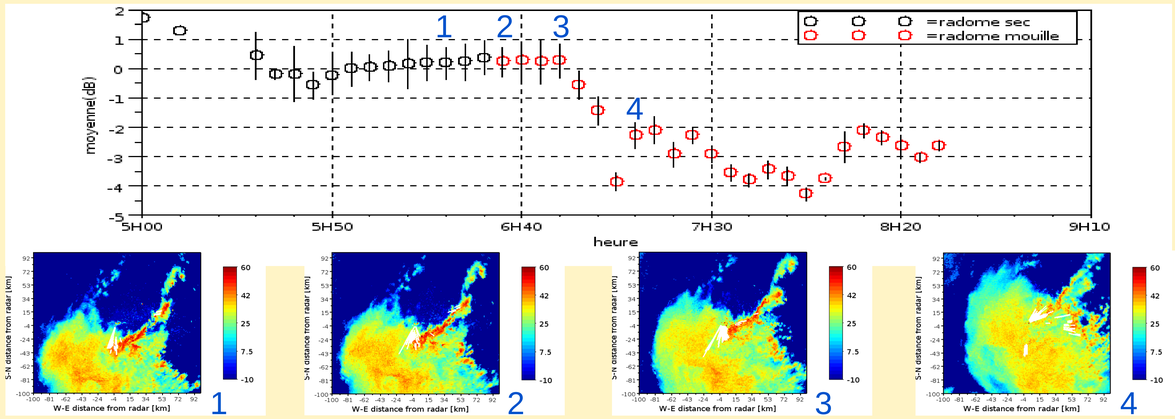
- 90°: Elevation: System bias (Operational)
- Sun hits: RX bias (Operational)
- Light rain: Space dependent bias (Operational)

Zh:

- Sun hits: RX bias (Operational)
- Monthly Radar-Rain Gauge comparison (Hydram factor): Relative bias (Operational)
- Self-consistency method: Absolute bias (Under study)

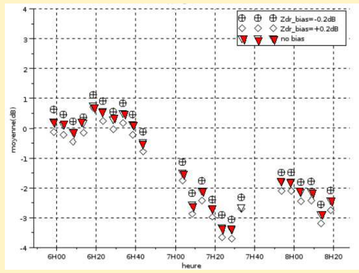


Effect of Wet Radome:



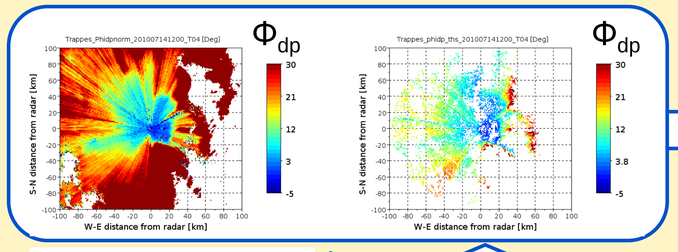
Sensitivity Analysis:

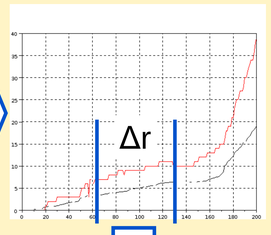
Δr_{min}=6 km: Trade off between sufficient data and minimization of spurious values



0.2 dB Zdr bias ~0.5 dB Zh bias

Observations **Model**



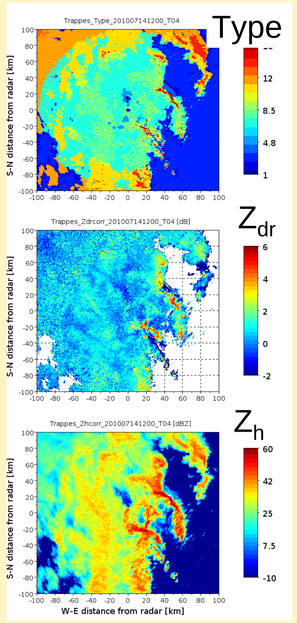


$$C_{\%}=\frac{\Delta\phi_{dp}^{th}-\Delta\phi_{dp}^{obs}}{\Delta\phi_{dp}^{obs}}\times 100$$

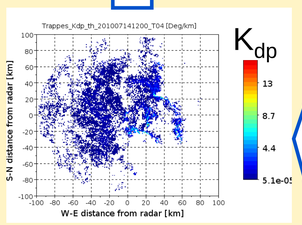
$$C_{dB}=10\log\left(1+\frac{C_{\%}}{100}\right)$$

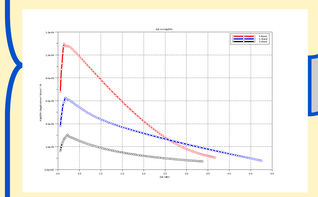
Scan average

Daily Weighted average



Pol Chain





Conclusion:

- Zdr of Meteo France radars stable within +/- 0.3 dB
- Self consistency technique:
  - Method applicable for operational calibration
  - Sensitivity to Zdr calibration error within acceptable limits
  - Great sensitivity to wet radome
  - Qualitative validation: Good agreement with trend found in Hydram factor
- Future work:
  - Long term statistical analysis
  - Application at X-band

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