

# NWP model evaluations of height-resolved diurnal water vapour cycles using lidar (DIAL) observations in the Arctic

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## Summer Iqaluit Diurnal Water Vapour Cycle Solutions

- Location: Iqaluit, Nunavut (63.75°N)
- Figure: Summer (April – August) diurnal water vapour mixing ratio cycle fits for ERA5, DIAL, and ECCC NWP GEM-HRDPS initialization times (00, 06, 12, 18 UTC).
- DIAL 250-500m measurements are excluded (grey region).
- All products agree well at the surface in magnitude and phase.
- ERA and DIAL agree well in phase above the surface. GEM agrees in phase everywhere except 600-1000m
- All products show an amplitude increase above 1400m; however, DIAL's amplitudes are much larger.
- Other seasons show similar levels of agreement
- Future work:
  - Evaluate GEM 24-hour forecast diurnal cycles
  - Compare IWV diurnal cycle in GEM and ERA with GPS
  - Analyze case studies of GEM vs DIAL

