# Results from temperature-controlled tests with the DPTS


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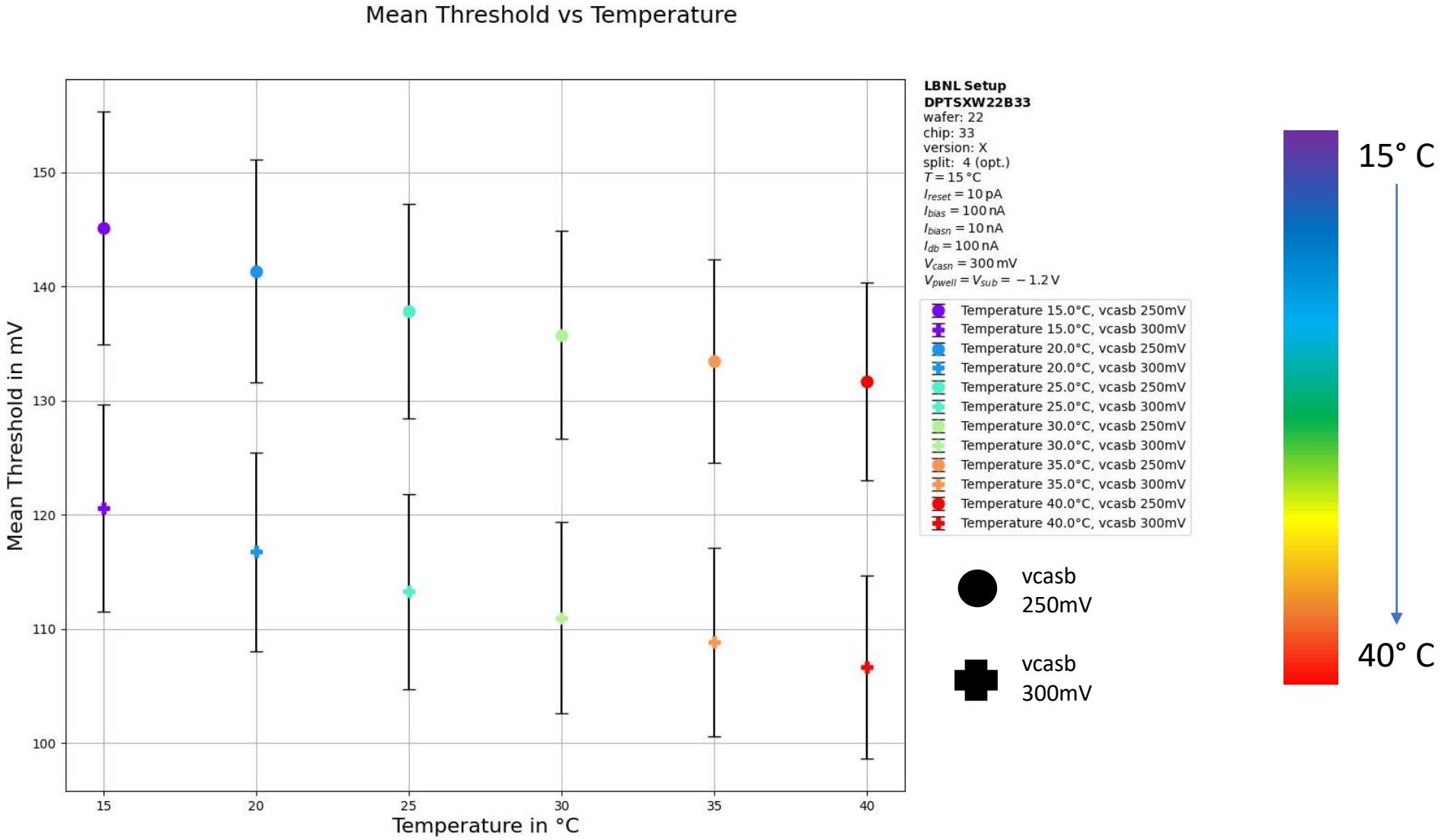
# Tests

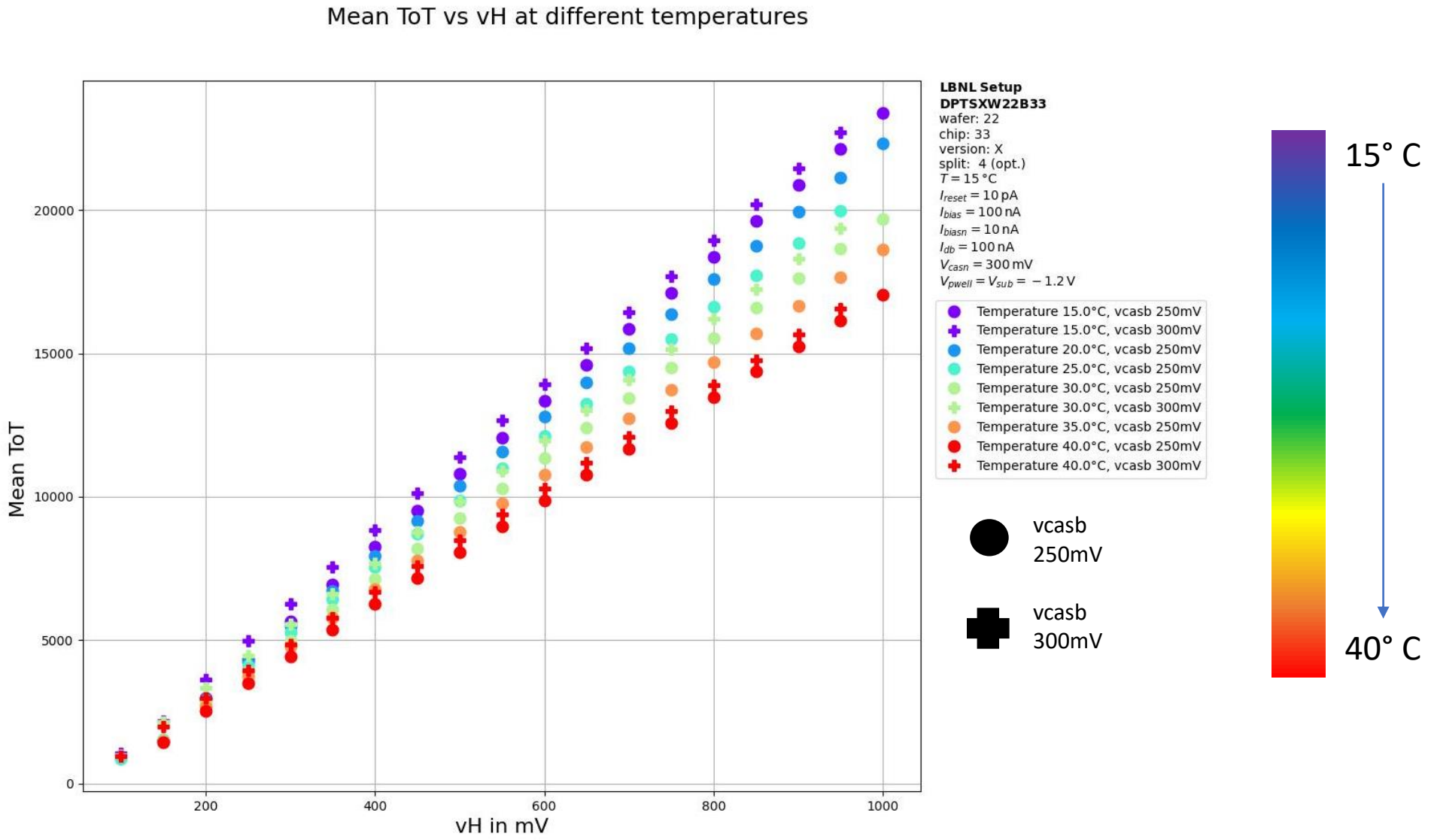
- 5°C steps from 15-40°C
- 1 set of Time over Threshold scans
- 3 sets of Threshold scans
  - different vcasb 250&300 mV
    + fixed threshold
- 3 sets of Fake-Hit rate scans
  - Vcasb (250/300mV) and ntrg (10k / 100k)
- 1 set of GID/PID calibrations
- No control but tracking of humidity

# Mean Threshold

-> Mean threshold decreases with increasing temperature

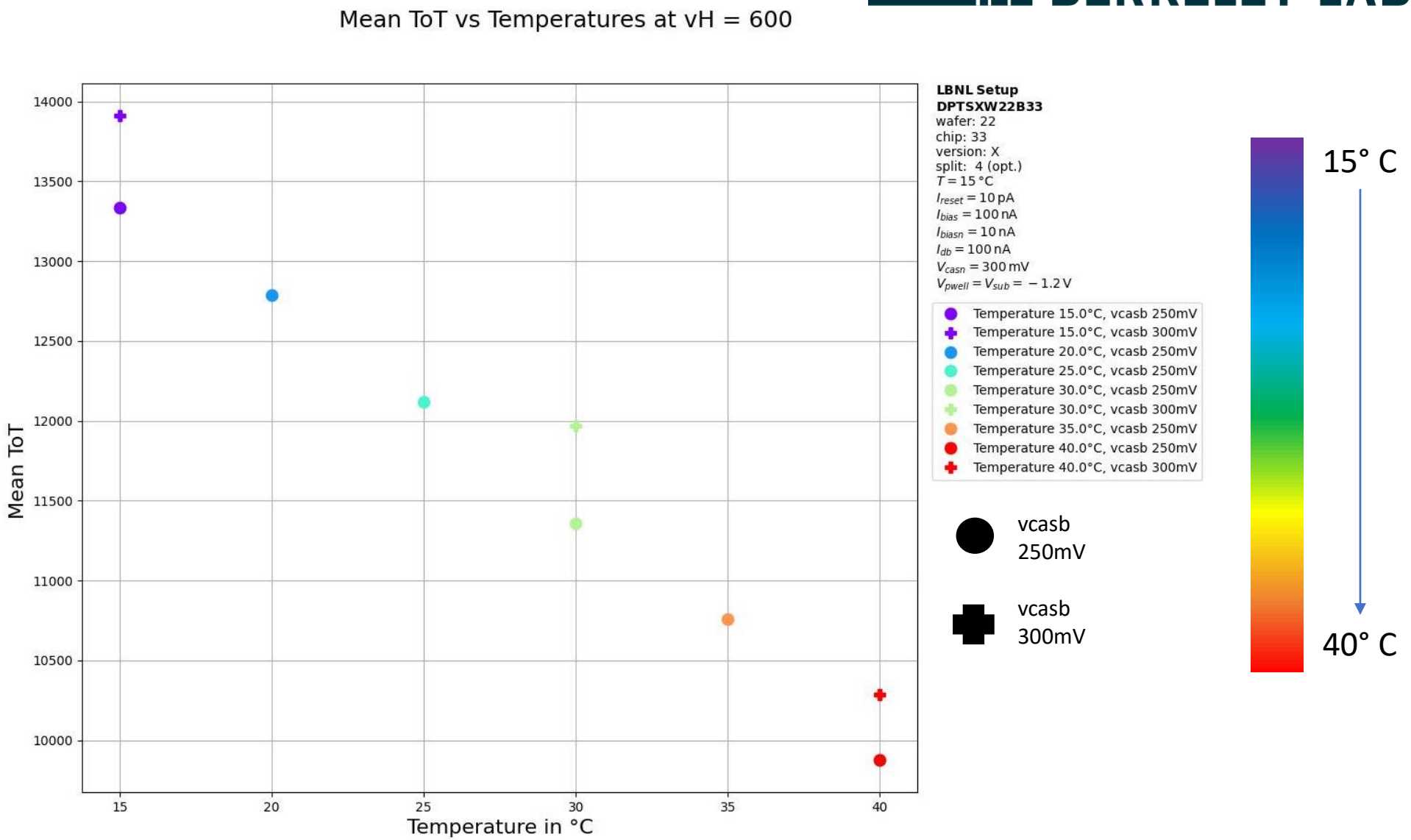


# Mean Time over Threshold

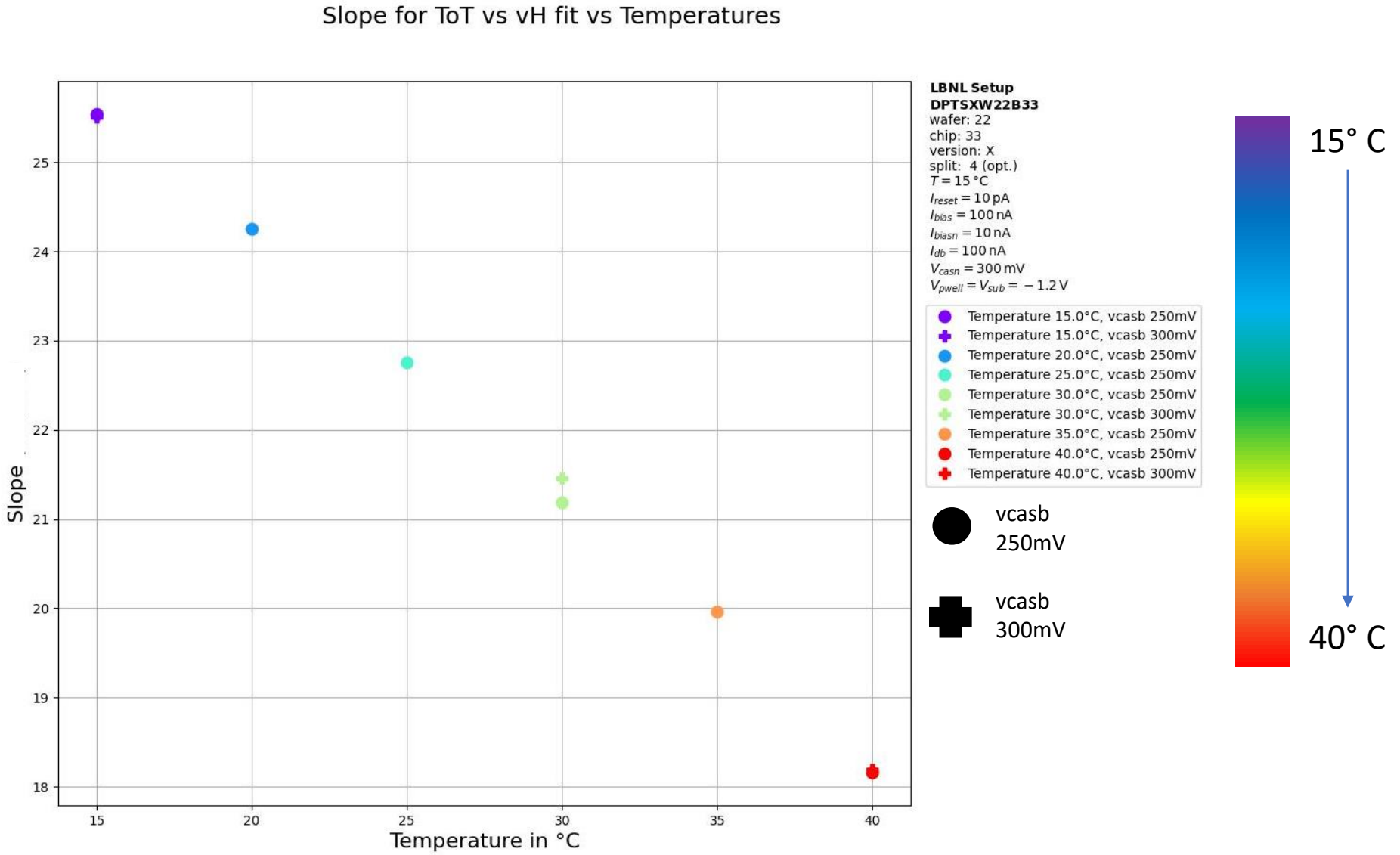


# ToT vs Temperature for fixed vH

-> ToT decreases with increasing temperature



# ToT linear slope vs Temperature



# ToT vs vH fitting parameters

$$f = aQ_{inj} + b - \frac{c}{Q_{inj} - d}$$

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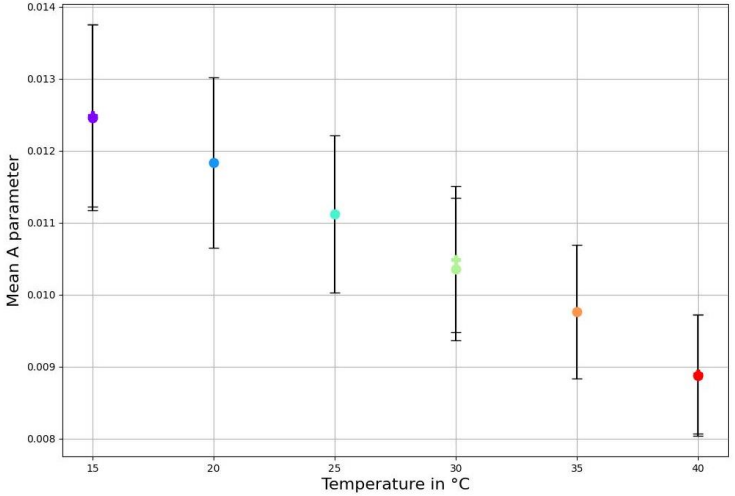
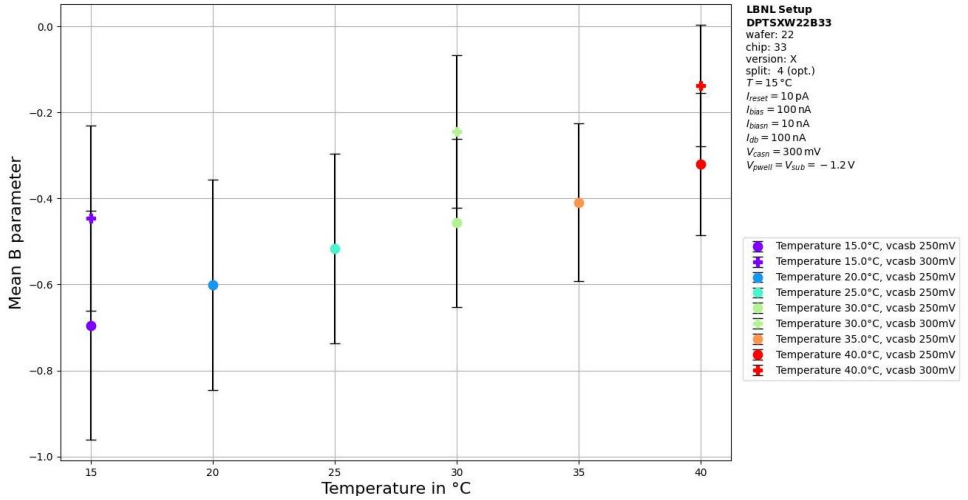
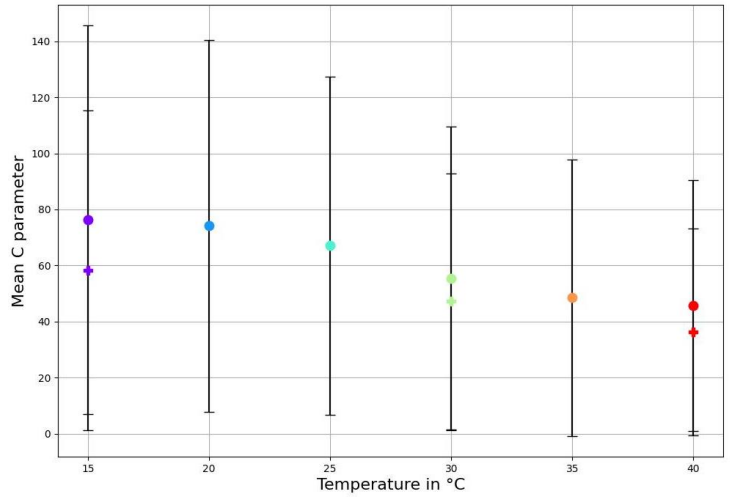
Mean Slope A vs Temperature for Tot vs VH fit



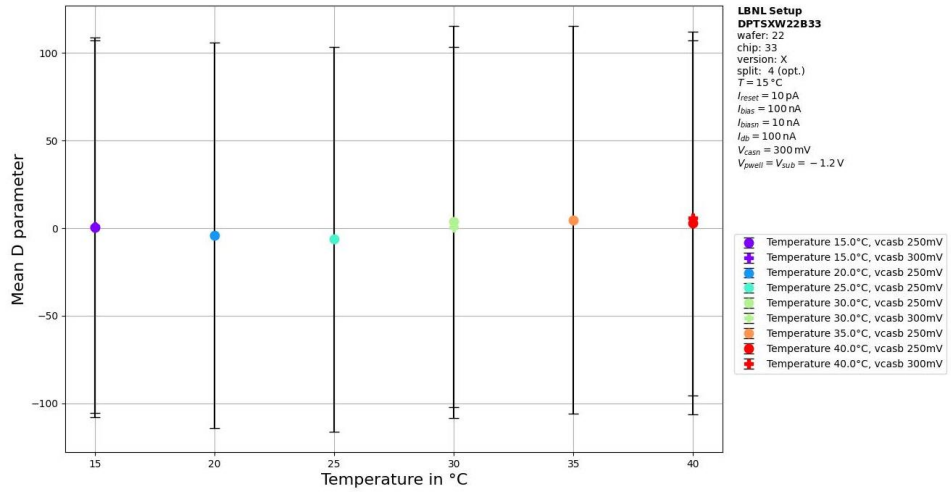

Mean Intercept B vs Temperature for Tot vs VH fit

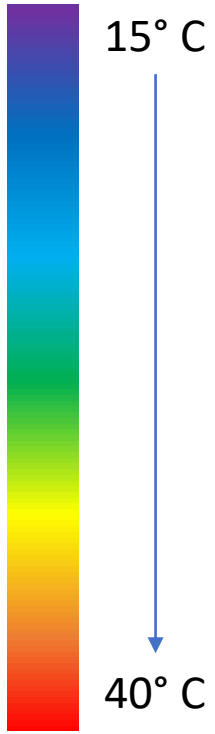



Mean Curvature C vs Temperature for Tot vs VH fit

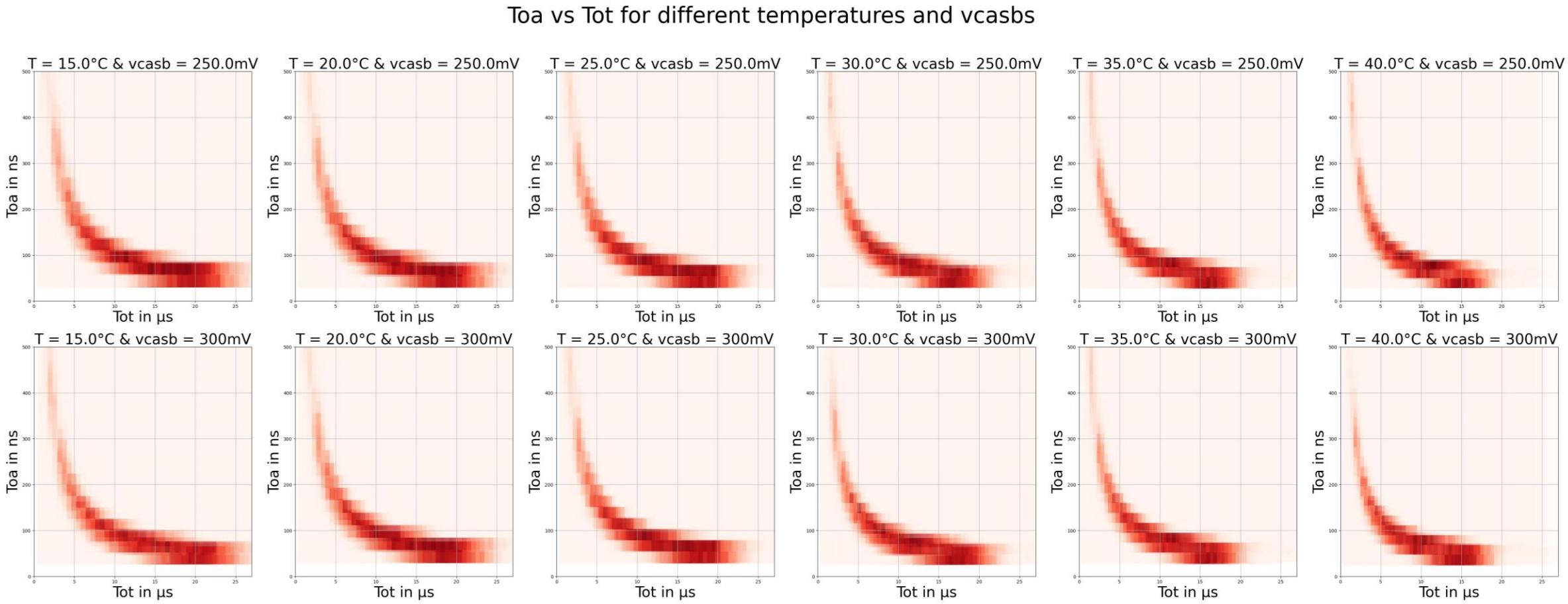



Mean Vertical Asymptote D vs Temperature for Tot vs VH fit



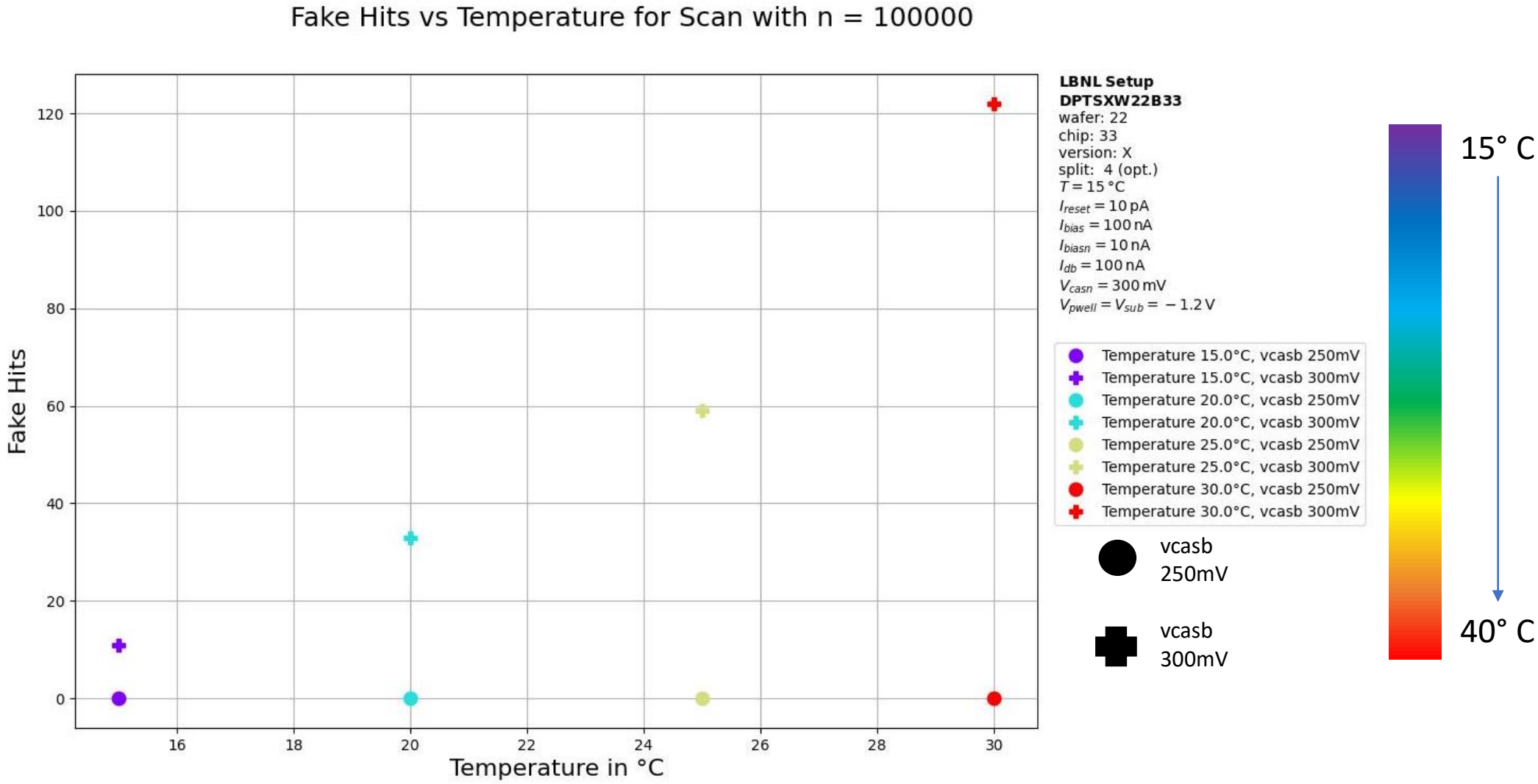
# Toa vs Tot




-> Time of arrival is temperature independent

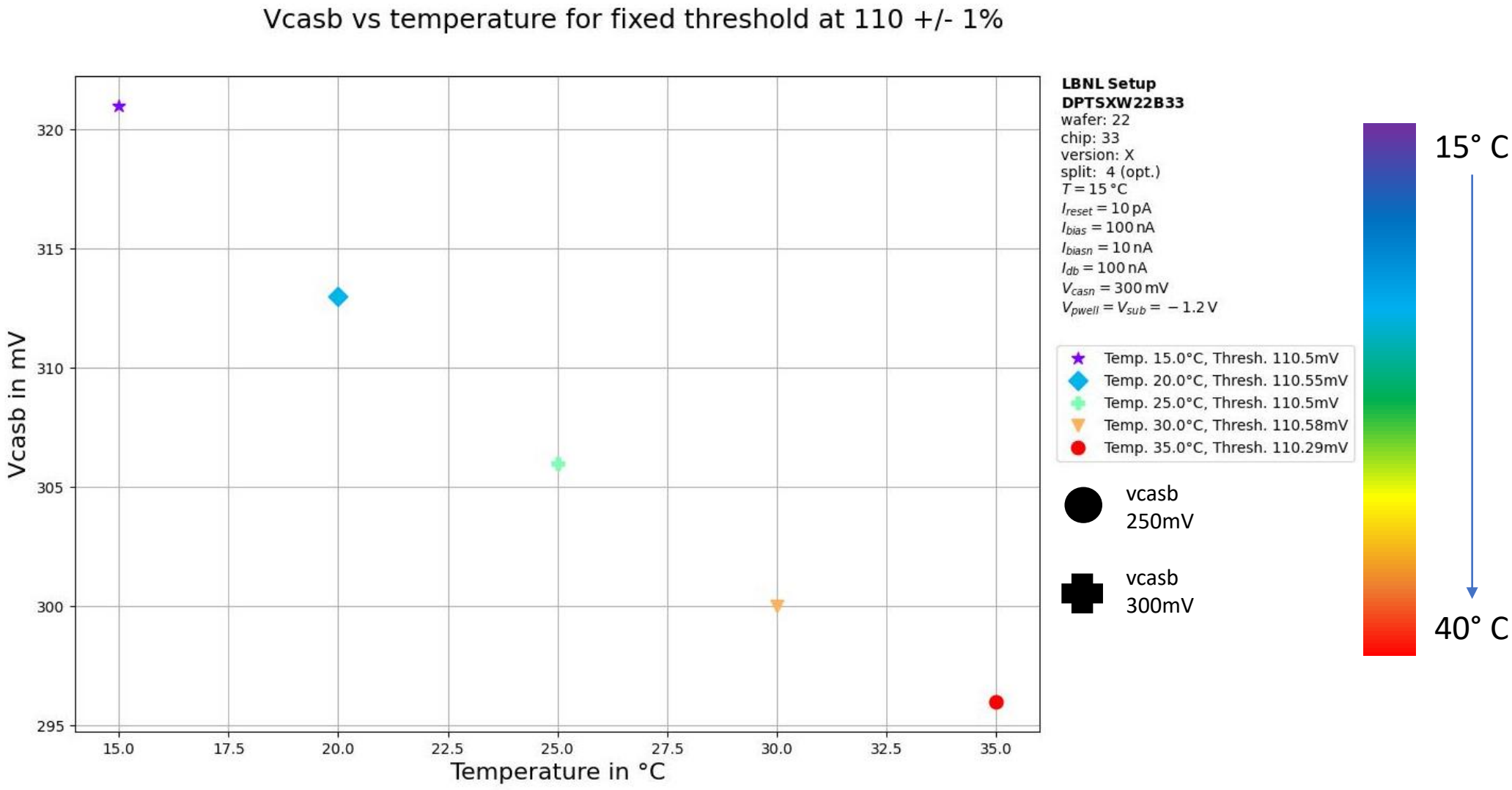
# Fake Hit Rate vs temperature

-> Fake Hit Rate increases with increasing temperature



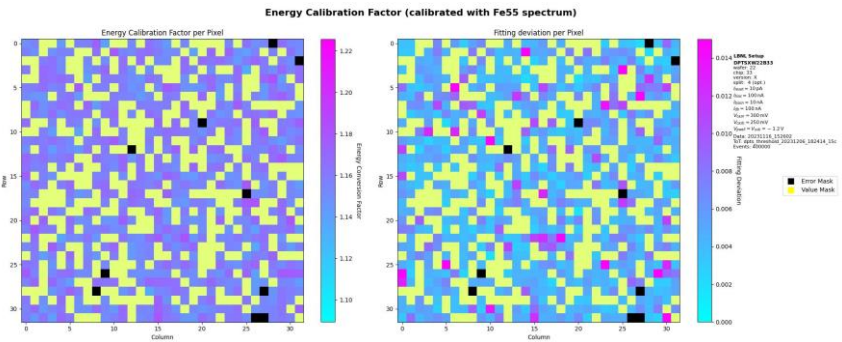
# Vcasb vs Temperature for fixed threshold

-> Vcasb decreases with increasing temperature

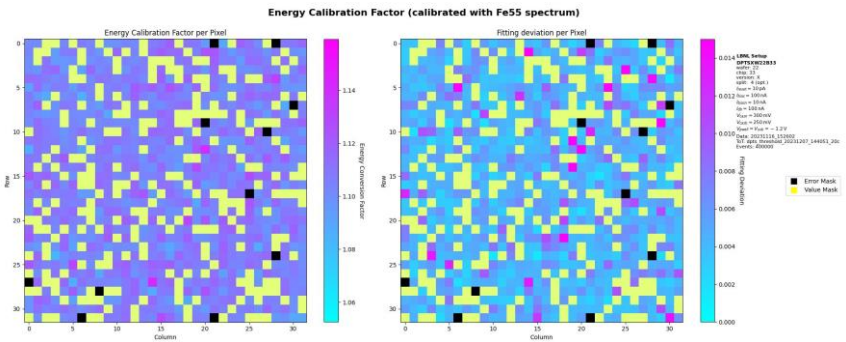


# Source data Calibration with different ToT datasets

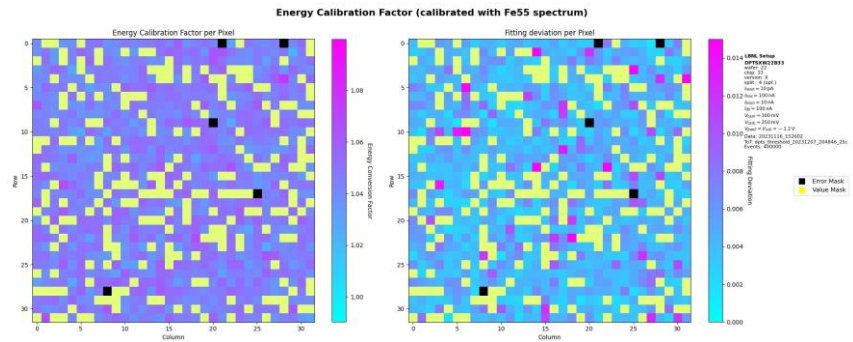
15°C



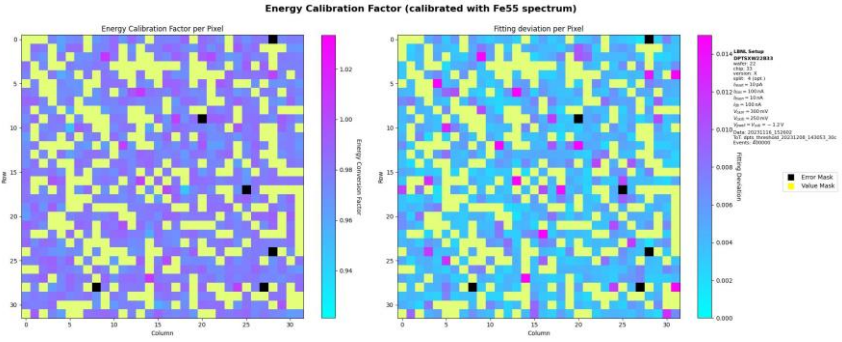

20°C



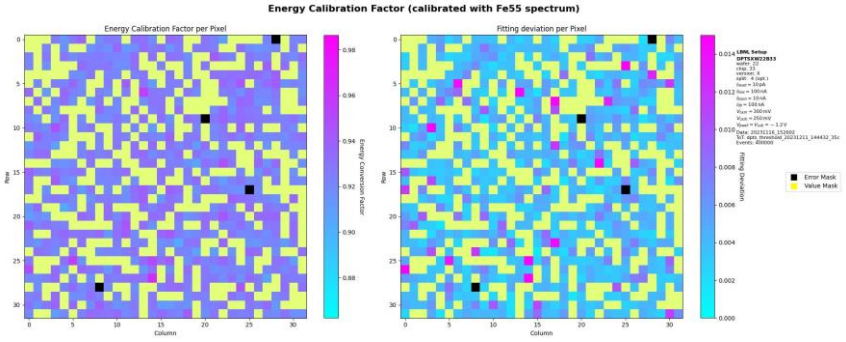

25°C



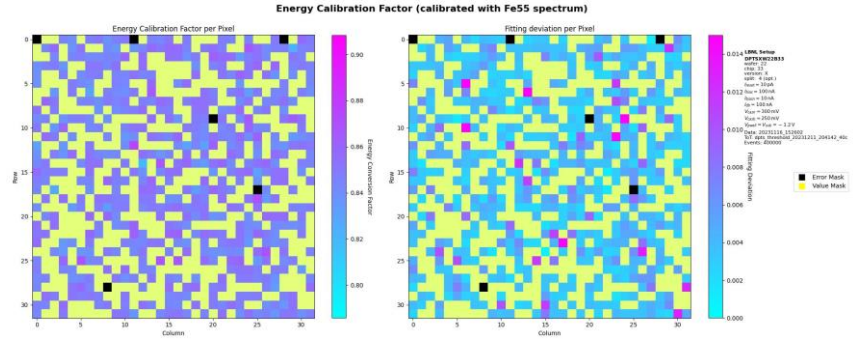

30°C




35°C

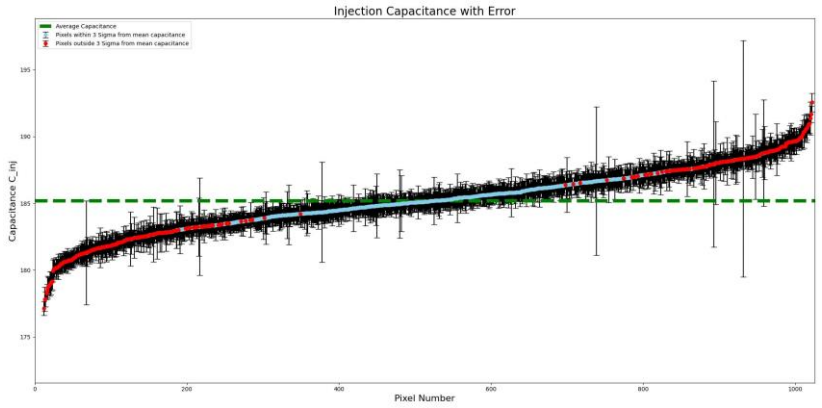



40°C

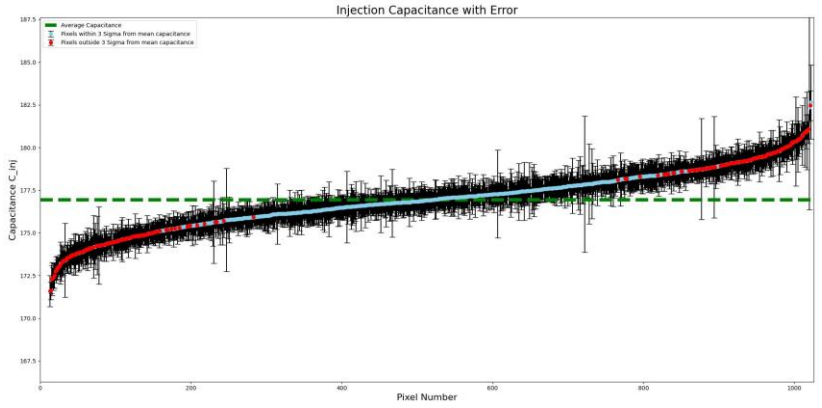


# Different Calibration of ~20-25°C source data set

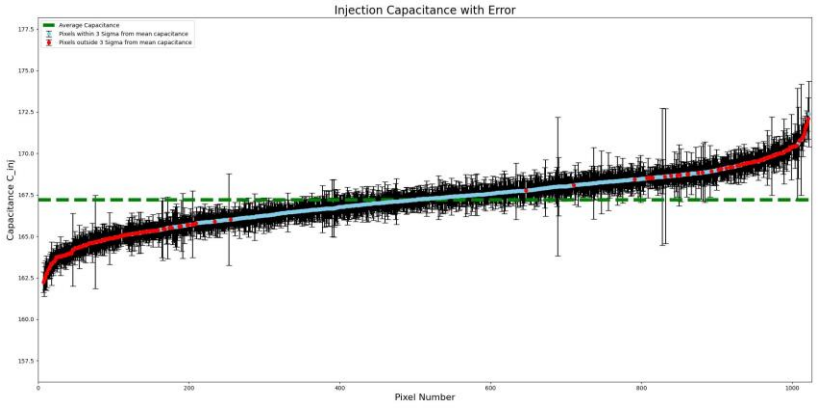
15°C



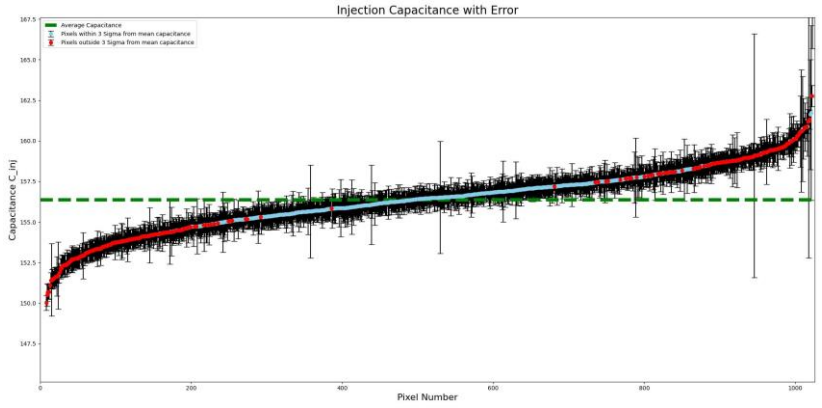

20°C



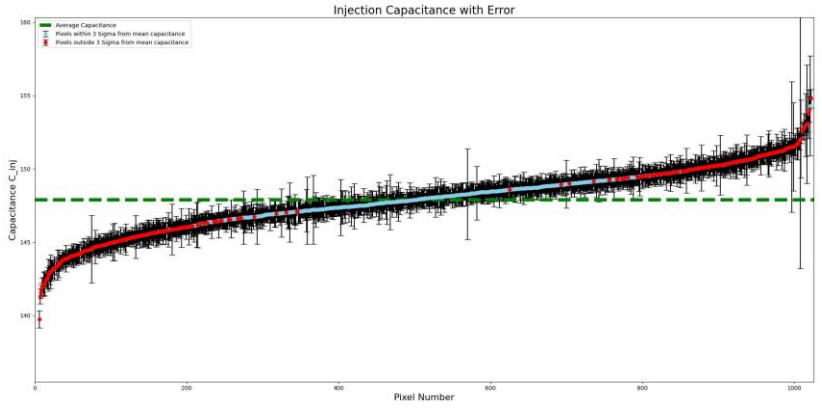

25°C



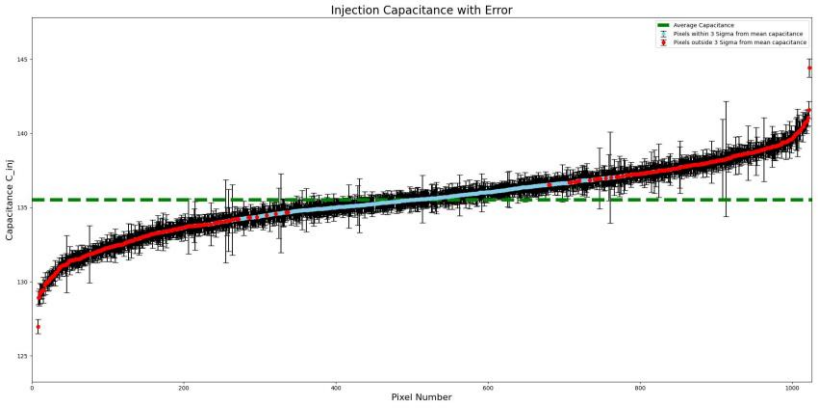

30°C




35°C




40°C



# Summary

- Calibration scan under same conditions than source scans is important
  - Strong pixel to pixel variation (at least 250 pixel outside 3 σ)
- With increasing temperature ↗
  - Mean Threshold ↘
  - Time over Threshold ↘
  - Time of arrival →
  - Fake Hit rate ↗
    - Fake Hite rate = 0 at vcasb = 250mV
  - VCASB at fixed threshold ↘
- Temperature ↗ -> vcasb ↗ -> Threshold ↘ -> Fake Hit rate ↗

# Backup