

# FBK IV analysis\* @ Ferrara

## \*tested by FBK

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DUNE photo-sensor meeting  
22/10/2024

# Content

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- **Differences with CACTUS typical data**
- **Results**
- **Changes in the algorithm**
- **Additional results**

# General info

## Samples

- 100 SiPM strips
- FBK model (HD pre-production)

## Aim

- Compare the IV characterization methods
  - CACTUS : relative derivative  $\rightarrow \frac{d}{dV} (\ln(I))$
  - Vendor : 2<sup>nd</sup> logarithmic derivative method  $\rightarrow \frac{d^2}{dV^2} (\ln(I))$

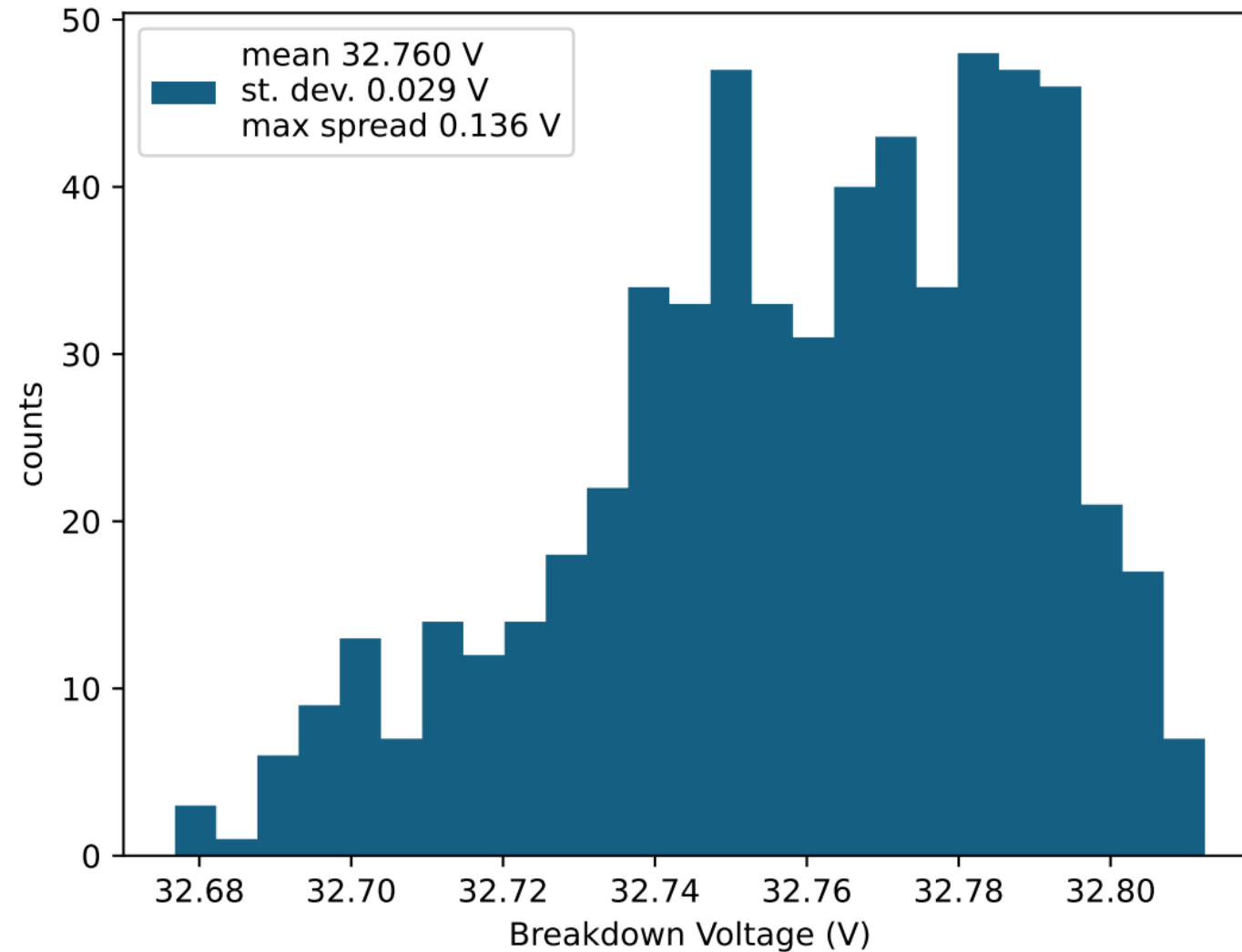
# Differences with our typical data

**Disclaimer:** The CACTUS analysis algorithm is somehow optimized for HPK strips, due to a higher population of measurements

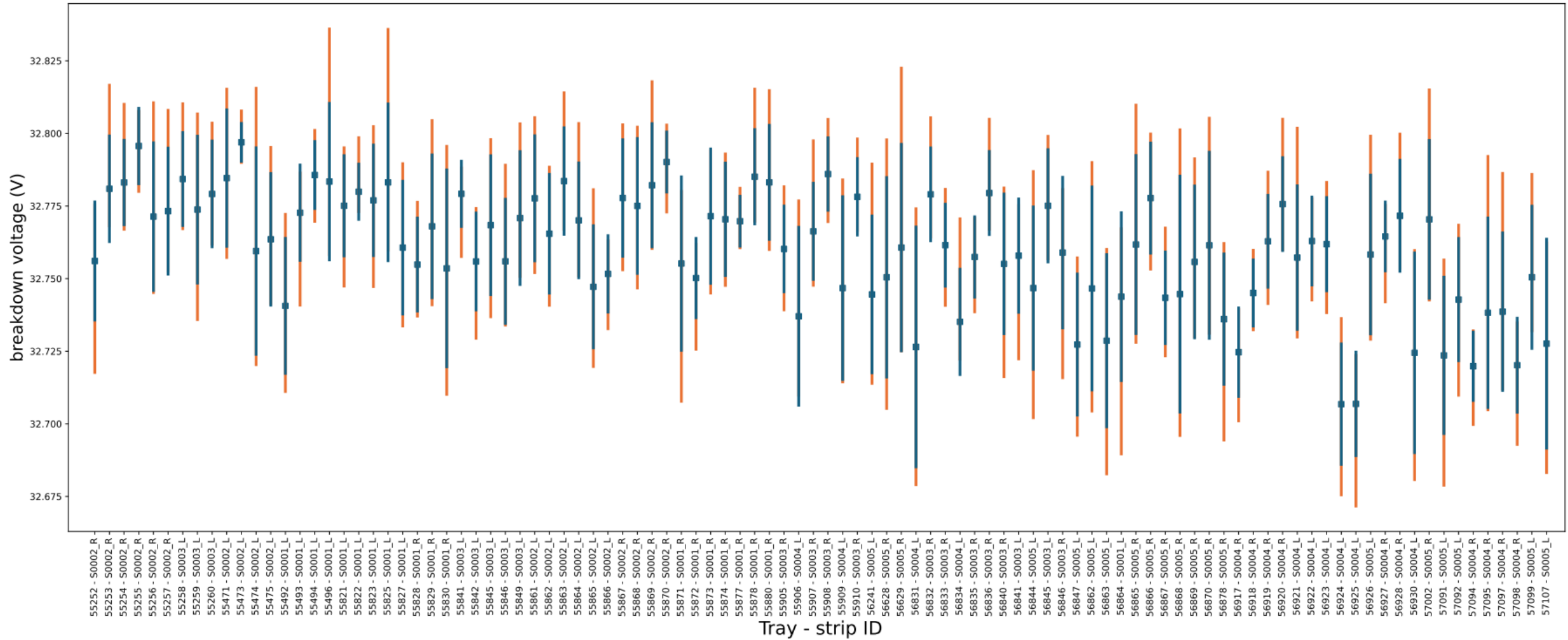
## Differences with CACTUS standard measurements

- Higher  $V_{\text{step}}$  : 50 mV vs [10 – 20] mV
- Lower noise : probably due to different instrumentation

# Results – $V_{BD}$ distribution



# Results – mean $V_{BD}$ per strip



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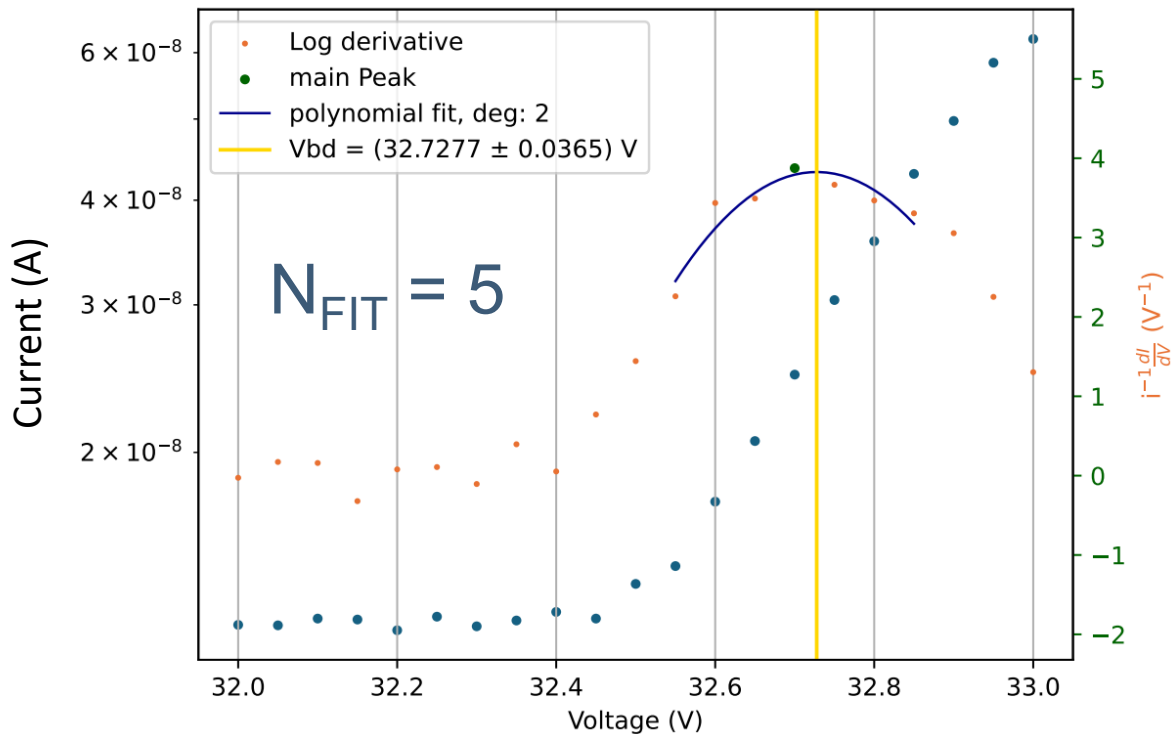
The range of the parabolic fit is not optimized



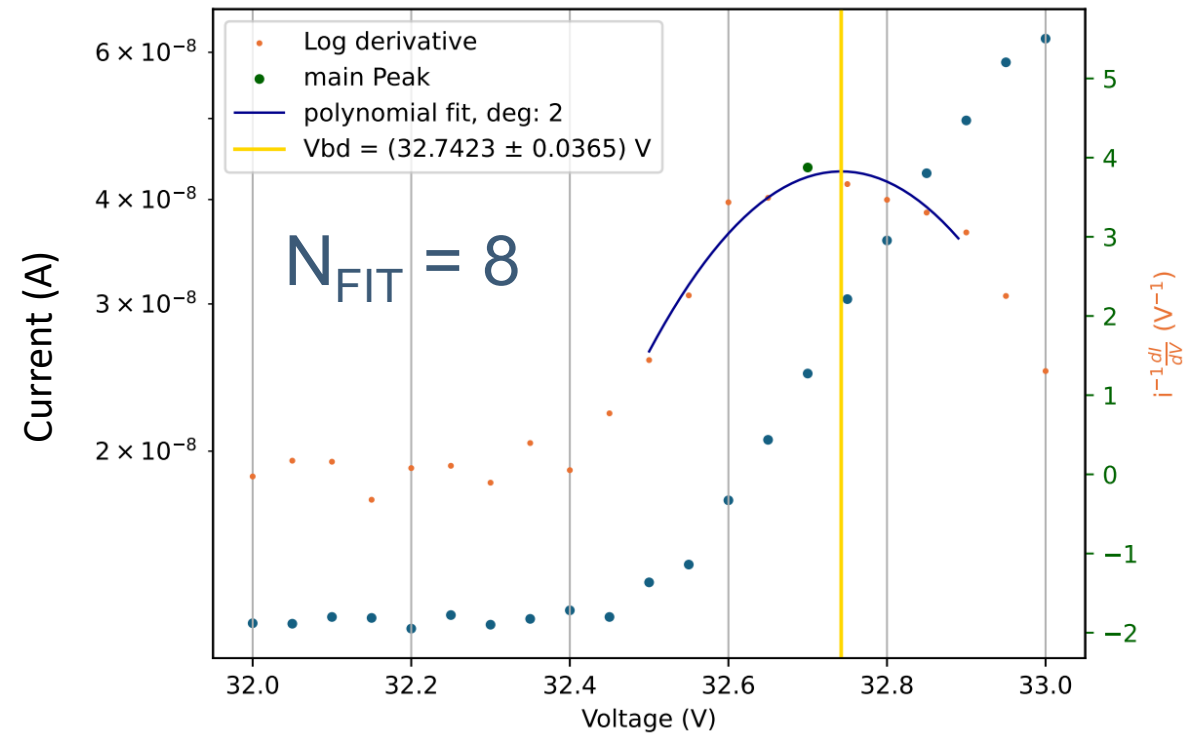
# Changes in the algorithm

Raise  $N_{FIT}^*$  ( $5 \rightarrow 8$ ) in favor of  $V_{BD}$  spread

Tray 55492, strip S0001\_L, SiPM 1

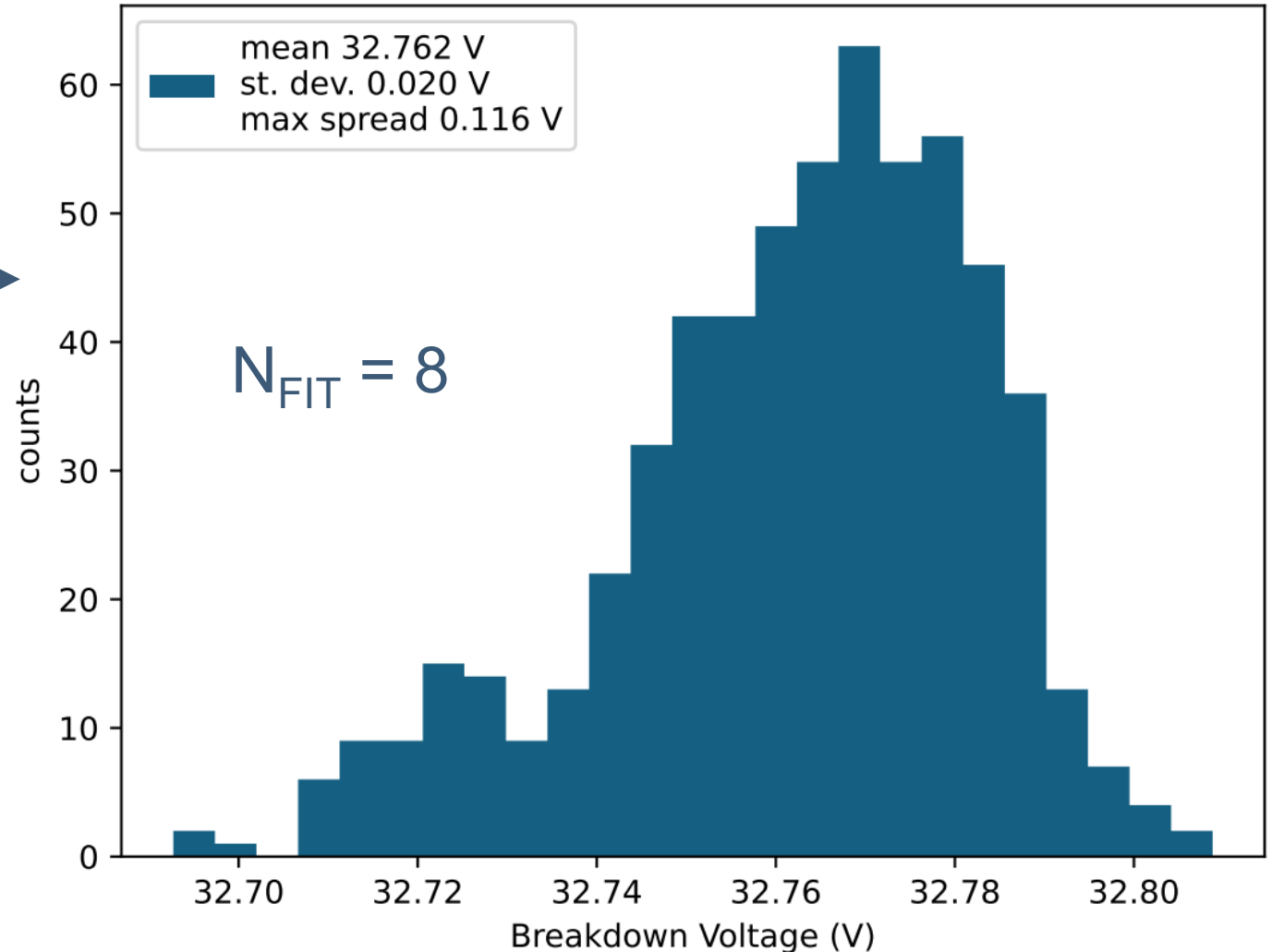
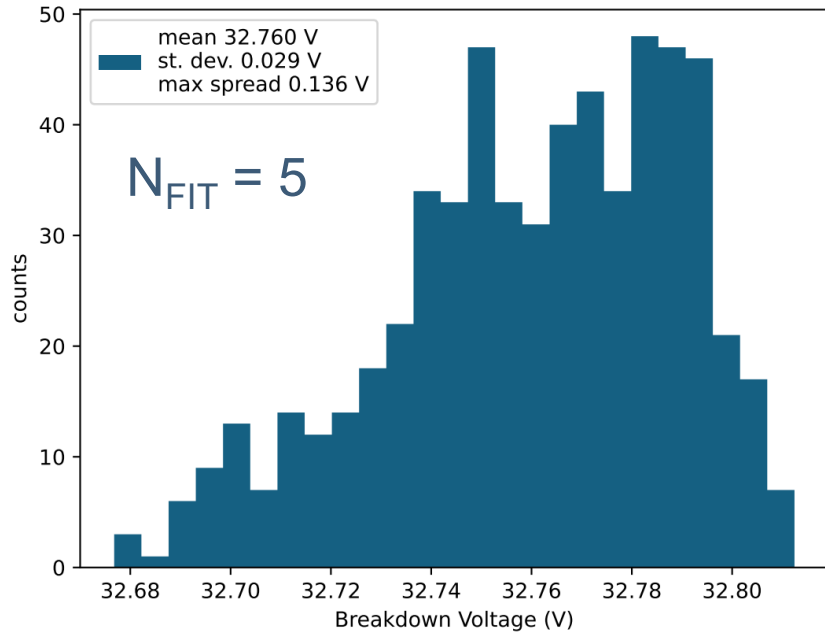


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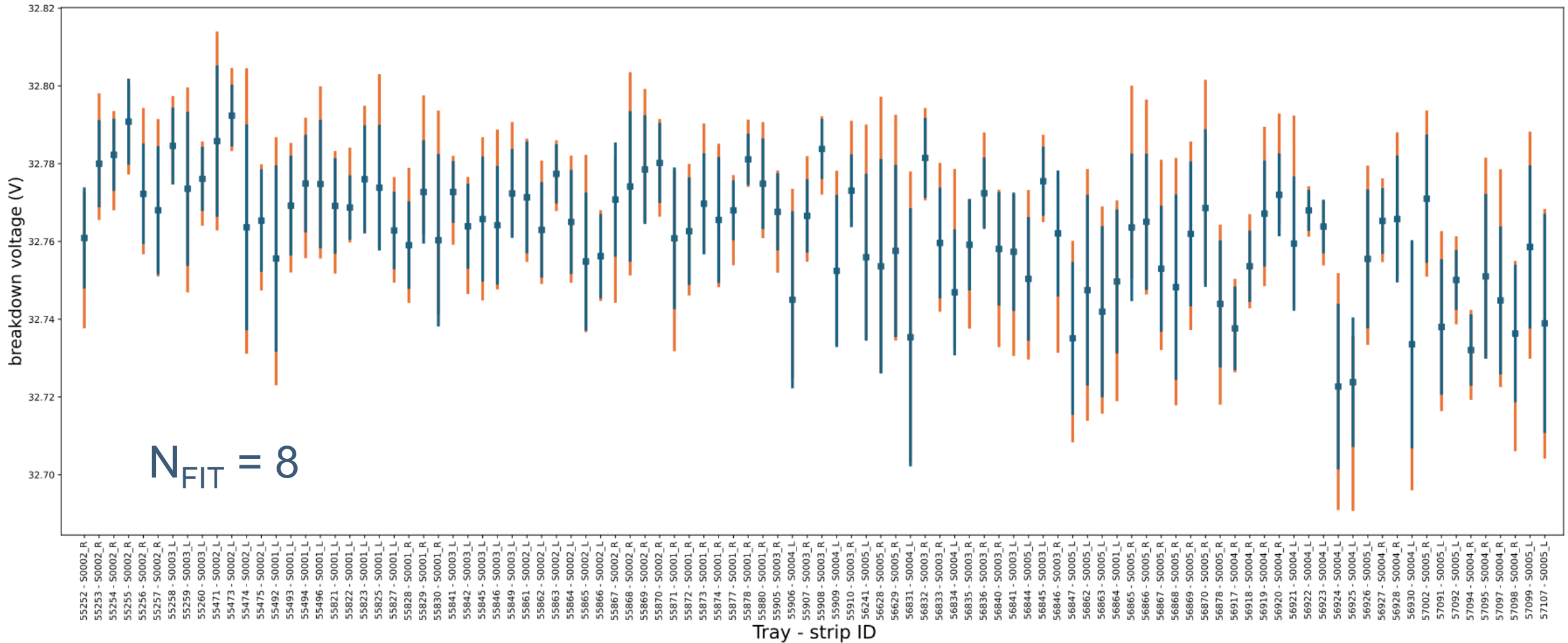
\* Minimum number of points for the parabolic fit around the first guess of  $V_{BD}$

# Results - $N_{FIT}$ - $V_{BD}$ distribution



- ~ same mean value ( $\Delta = 2$  mV)
- Smaller spread

# Results - $N_{FIT}$ - $V_{BD}$ distribution



# Conclusions

- **Received IV characterizations data from FBK**
  - 100 strips (for HD pre-production)
- **Analysis with standard CACTUS algorithm**
- **Differences with our data → tune the algorithm**
  - Optimization of fit range
  - Impact on the results

# BACKUP

# Reverse IV analysis methods

