

# Performance of Belle II Tracking on Collision Data

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**Belle II:**

- Study CP violation and rare decays of B-Mesons
- New detector design motivated by high inst. luminosity
- Combination of three tracking detectors for excellent tracking performance

**Tracking of typical  $\Upsilon(4S)$  event:**

- 11 tracks with soft momentum spectrum (find all tracks with  $p_T \gtrsim 50$  MeV)
- About 2 orders of magnitude more background than signal hits

**Modular tracking framework:**

- Can be adopted to background conditions, detector degradation etc.
- Easy extension with novel approaches

**Track-based analysis:**

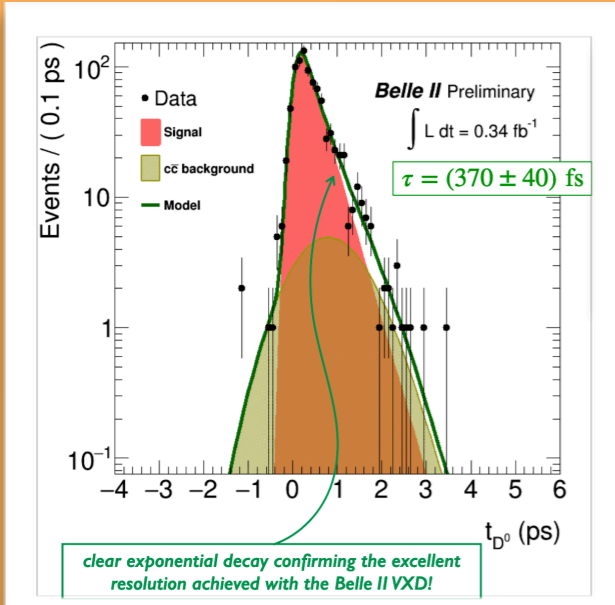
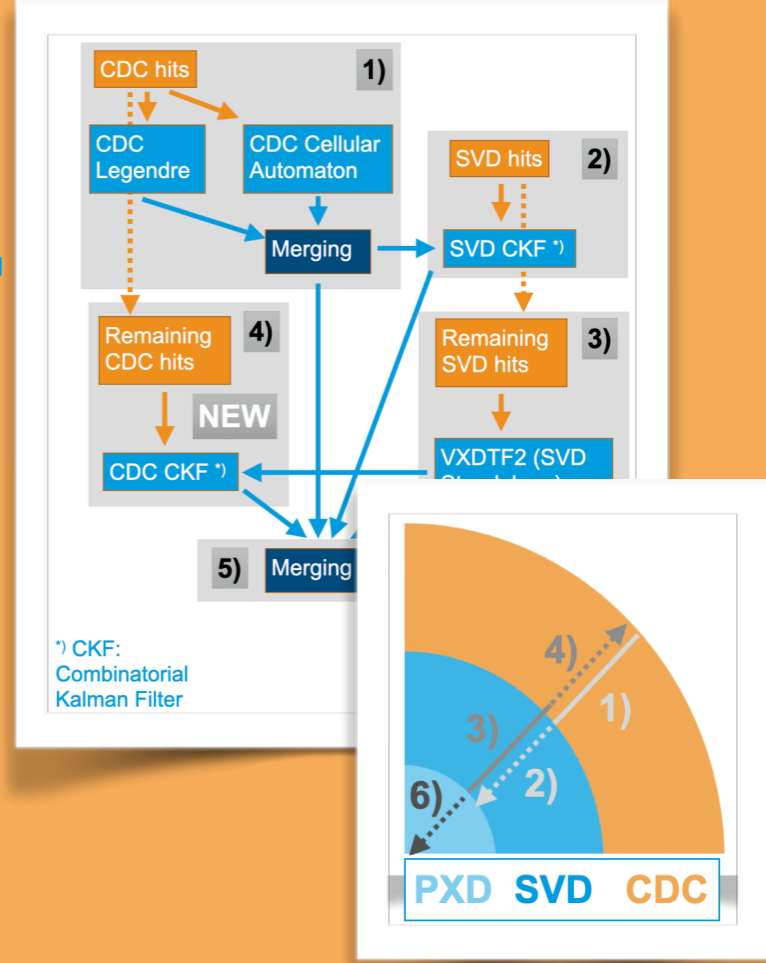
- Determination of  $D_0$  lifetime as excellent exercise
- Confirms excellent track resolution and good understanding of systematic effects

**Performance:**

- Consistently high track finding efficiency
- Running stable on HLT
- Algorithms robust against beam backgrounds

**Monitoring and Validation:**

- Variety of Tag-and-Probe studies for different momentum regions
- Excellent performance of detectors, algorithms and alignment: Impact parameter resolution of just about  $12 \mu\text{m}$



More details in Belle II Tracking Paper  
[arXiv:2003.12466](https://arxiv.org/abs/2003.12466)

