

# BELLE II QCD Studies Status

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# Overview Topics

- Fragmentation/Hadronization studies
- Fundamental QCD studies and input to current and next Gen experiments (e.g. EIC)
  - FFs: Focus on statistics hungry channels and building on Belle I experience
    - *e. g.* Polarized  $\Lambda$ ,
    - Correlations and multidimensional measurements
    - Charm/uds separation based on new Vtx detector
  - Jet program
    - Belle II energies more challenging for perturbative calculations
    - Much to be learned from comparison to LEP data
    - Examples: jet rates, transverse momentum imbalance, jet structure, T-odd jets...
  - Measurements to benchmark MC models
- Exclusive Cross-Sections to constrain HVP for  $g - 2$

# Activities/workforce

- Currently most activities are performed by Duke, RIKEN and IKERBASQUE groups
- Started MC studies of jet production at Belle II
- Started MC studies of FFs at Belle II
- Initiated discussion with MC groups on important Belle II contributions
- Initiated discussion with  $g - 2$  theory initiative on HVP related measurements

# Plans

- Belle II produced several  $ab^{-1}$  in MC samples, sufficient for the studies needed for the white paper
- FFs
  - Much of the FF part of the whitepaper can be extrapolated from existing Belle data
  - Charm identification will be studied in more detail
- Jets
  - Dedicated studies on MC under way
- $g - 2$ 
  - Effect of new trigger and methods to reduce systematics have to be studied