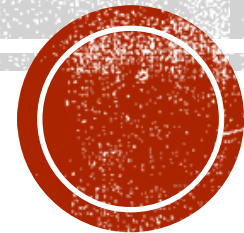# pfRICH proposal plans

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pfRICH meeting

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# ELECTRON/PION SEPARATION

- Provide e/$\pi$ separation performance at low $p$, where eCAL cannot be used to identify (scattered) electrons
  - PID (pfRICH) table available for $p < 5$ GeV/$c$
  - Available MC sample: DIS with $Q^2 > 1$ GeV$^2$/$c^2$
  - Do we need/want sample with $Q^2 < 1$ GeV$^2$/$c^2$?

1. Pure MC distribution to demonstrate particle mix in pfRICH acceptance
   - Identification of potentially problematic parts of kinematic phase space
   - Should be ready, can adjust based on specific needs

2. Apply pfRICH PID tables to MC
   a) Simple suppression of MC pions using the table
      - Done and presented in the past
   b) Include electron PID and pion mis-PID
      - Current version uses the PID table directly which assumes 100% selection efficiency
        - Low purity at higher p
      - Need to update algorithm to take into account Gaussian PID widths
        - Information should be available in the input files

3. Do the same on RC level
   - Need to add same updates as for MC level, otherwise ready

# SIDIS IMPACT STUDY PLAN

1. Apply information from pi/K/p table
   - Working on update of (mis-)PID implementation
     - Originally using values from PID table directly
       - Values assume 100% efficiency for each particle species which leads to poor purity at higher $p$
     - Input files should contain information about Gaussian means and widths for pi/K/p
       - Can add additional PID cut to improve purity, but at lower efficiency
   - K purities in $p$ and $\eta$ bins
   - Later this week

2. More specific SIDIS oriented study
   - $dN/d\eta$ distributions of K in various $(Q^2,y)$ or $(Q^2,x)$ bins
     - Evaluate when and how many K fall into pfRICH acceptance
   - Can/will do the same for $\pi$ and p
   - In combination with 1 will provide estimate on pfRICH importance for such studies
   - Next week

3. Reconstruction of $\Lambda$ hyperon
   - Alternative/addition to 2., if desired

# THANK YOU FOR ATTENTION