Jeopardy!

What we need from 2019 data and 2019 detector MC

- Calibrate and process enough data to be able to show that the vertex resolution is what was expected/promised with L0 upgrade. Need a vertex distribution of e+e- pairs with a fit to the core of the distribution
- Show the invariant mass distribution of e+e- pairs to demonstrate mass coverage of 2019 data
- Show Esum for e+e- pairs with and without e- cluster to demonstrate that the single arm trigger worked and we gain x2 more pairs
- Validate MC setup using the Esum, vertex, the invariant mass, ... distributions of e+e- pairs using the 2019 data
- Run simulations for 4.55 GeV to show preliminary agreement between the data and MC
- Simulated long leaved A's to show increased acceptance after moving L1, L2, L3 towards the beam
- Estimate 2019 reach
- Estimate reach for a 4 PAC weeks of running at 3.7 GeV (2021 run)
- Estimate reach for two more energies, ~2 GeV, ~4.4 GeV – after 2021 we will be left with 105 PAC days

Plots for jeopardy doc/presentation: 2019 Run

- General points on plots
  - It would be good if they were all made with coherent set of data and MC
    - Same detector, calibrations, recon etc…
  - More important though is they should have a coherent story, which is, hopefully: "We collected a lot of good data in 2019 and, while alignment/calibration is not perfect yet, the detector performed reasonably close to how we expected"

Plots for jeopardy doc/presentation: 2019 Run

- Calibrate and process enough data to be able to show that the vertex resolution is what was expected/promised with L0 upgrade. Need a vertex distribution of e+e- pairs with a fit to the core of the distribution

  - Well...we're off to a bad start...see PF's talk yesterday; vertex resolution is ~x3 too high
    - BUT, it's very likely due to misalignment; MC looks as we expect … should be able to get the data down with upcoming effort effort on alignment
    - I think we should give alignment team until collab meeting (~1 month) to get a set of alignment constants to use for jeopary document; not final, just good first pass
      - Just show for L0L0 events
    - I liked the info showed in PF's slide 25 (apart from KF vs GBL points)...show current performance and MC (design performace, hopefully we can get close); also show that old plot comparing old and new detectors

Plots for jeopardy doc/presentation: 2019 Run

- Show the invariant mass distribution of e+e- pairs to demonstrate mass coverage of 2019 data

  - Simple, BUT the difference between KF and GBL distributions give pause
    - Should check with MC
  - Compare to 2015/2016 coverage?

Plots for jeopardy doc/presentation: 2019 Run

- Show Esum for e+e- pairs with and without e- cluster to demonstrate that the single arm trigger worked and we gain x2 more pairs

  - Good idea! While we are at it, we should check timing distributions to see how much higher rate of accidentals we get (not necessarily to be shown in jeopardy).
  - Again, comparing this with MC would be interesting (though need to add WAB/tridents appropriately which is pretty rough at this point)

Plots for jeopardy doc/presentation: 2019 Run

- Any other plots we should include?
  - Anything specific to new trigger (i.e. x-vs-energy)
  - L0/L1 performance, other SVT performance?
  - Other analysis-level things (track efficiency? FEEs, WABs?)