Today's agenda:

- What is the size and scale of E field distortion issues we want to consider? How do we get intuition about the problem with existing tools?
    - - Francesca, comparison of SCE on and off
- What are next steps we can take to start to propagate uncertainties?
    - https://docs.google.com/document/d/1uE5Tn1o4QBXsQdo6Gv2rBF80Vct4NK5E2Iq8dqws7oU/edit

Action items:

=> Need to determine how we want to handle non-standard E field distortions (for calibration)

- => Need to consider what we need for these specific studies, Francesca to iterate with Jake and Ajib and Tingjun

=> Discuss: What variables do we want to project in? For SCE on/OFF comparisons and/or evaluating systematic effects.

=> Discuss: Francesca's propaal for a calib closure test -- email thread.

Transcript:

Attendees: Jake, Miguel Garcia, Richie D., Sabrina, Tingjun, Ajib, Georgios, Xianguo, Zahra

Francesca, comparison of SCE on and off

link to slides

- Focus on region of interest where there are stats. See "lensing" effect, where SCE ON have less particles interacting in the beginning of detector.
- TY: p3, with SCE on, expect distortion to beam starting point//start of track, about 30cm? Why any entries in first bin, below 30cm? JC: is it the calibrated one? TY: Ah, ok. => Look into it?
- TY: Focused on SCE on calibration? How do we assume calibration for SCE off sample? FS: Used what is linked in fcl for SCE off sample as an input. No calibration? TY: Still need to convert ADC to MeV. FS: Nothing there then that's reliable? JC: there are some settings which are there for SCE off. These are values in files from Ajib and his notes. AP: We don't have calibration for this SCE off case-- maybe using one for sample prior for this? I had just produced for SCE on sample. FS: I used whatever is in calibration fcl for SCE
    - => Need to determine how we want to handle non-standard E field distortions (for calibration)
    - => Need to consider what we need for these specific studies, Francesca to iterate with Jake and Ajib and Tingjun
- JC: I hadn't appreciated-- the interacting energy is some assumption of initial energy of pion, and subtract all deposited energy up to interaction point. Regardless of SCE, that charge isn't lost-- it's distorted and shifted around, integrated all of it, except for any effects around FV.

        - => Discuss: What variables do we want to project in? For SCE on/OFF comparisons and/or evaluating systematic effects.
- Proposal: Confirming calibration: Compare
    - If no SCE == or perfect calibrated SCE, dE/dx of MIP, and then see increase of it. SCE effect with no calibration, shifted inside. All the dE/dx is squeezed to entry point. We therefore a high dE/dx so it flattens out-- and then a MIP, and then final range rises. Provides a point to point correction to compare to what the calibration looks like-- then a systematic for the calibration. Avoiding to go through E field.
    - Use beam pions (know gap, and know entry point) and/or CRT tagged tracks for Richie's samples.
    - Verify in data, that we see this effect with and without calibration applied, and see if it agrees in uncalibrated MC.
    - TY: The point is to not apply SCE calibration-- and then compare that with data? SCE off don't need to apply calibration, but also have a calibration for SCE on sample. Should agree...FS: Is this an alternative enough approach to make a simple calibration to what we already have-- give rise to a sense of what the systematic error is on the calibration.
    - GC: I'm a little confused here-- if we really want to do a systematic to compare data and MC-- check the dE/dx for data and MC? FS: No, this is not data/MC to compare those two-- but an alternative calibration to compare calibration A and B.
    - RD: I personally don't think it's complete yet-- but I like this idea and the argument I would make for why ut's worth doing: 1) It's simple to do, put into flat tree. And 2) heard it was tested-- Ajib-- forward/backwardness of Mike Mooney's map-- 180V SCE map-- on persistent drive-- one corrects MC and one distorts MC. Different in how it introduces the effect. It isn't one to my knowledge which has been evaluated?
    - AP: Let's talk more, still thinking.
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    - RD: There's no flattree for the RITM. There is a Prod. 3 dQ/dx calib file for the performance paper MC of prod 3 but not this updated Prod. 3. AP: Yes that is correct
    - => Discuss with Ajib and Francesca, will take a little time to produce the constants.
        - AP: There are instructions if you want to try it-- we may need to do it again. And, can help if in case of issues.

Discussion:

- Option A) Use an alternative map (Ajib's)
    - We have spatial distortions for certain regions

- Some regions in Y can maybe be neglected for xsec-- use default SCE values from Mike and/or linear extrapolation.
- Discuss: Z distortions
    - Option B) CRT if available - Richie?
        - RD: The tracks are parallel/colinear, then the measurement of crossing track will come back with nonsensical answers (both negative and positive swings, with centered correctly. Hurts precision of the study. Compared to Ajib, tracks perpendicular to plane-- didn't see it.
          => Next steps for Richie-- run a little more MC to see if the answer is sensible, and more data-- if the results are similar can consider it fair game to be used

GC: Short report for this at DRA-- update everyone on this tomorrow, update each week
=> Kendall and Francesca to prepare it

Next meeting:

- Lifetime: later!
    - dQ/dx flattening first step is actually SCE piece.
- Reco vs. true variables to get a handle on this? What is the endpoint of the study?