Tracker Software Review: Meeting 2: Actions

AD: Compare data/MC efficiencies for 8681
CR: Generate list of uncertainties and show what has been done so far (alignment, scattering, energy loss, field uniformity, etc).
PK: Check dead channel & noise handling in MC.
AD: ***pattern recognition/efficiency:***

- Study "10%" of missing 5-point tracks; where in the p.r. does the missing point get rejected?
    - Conjecture is that the linearised parameterisation poorly describes a set of tracks, causing 5-point tracks to be rejected. In addition, the s-z fit may cause good 5-point tracks to be rejected. Non-linear circle parameterisation appears to be better behaved, but, chi2 cut needs to be optimised and possible feature in s-z fit needs to be studied.
- Scan events in which 5-point tracks are rejected
- Remove requirement for one hit per station in data and study performance. Also, study multi-track MC
- Plot Chi2 distributions etc. on log scale (to emphasise tails)
- Optimise Chi2 cut for "MINUIT" variant
- Recover reasons for shape of hits-per-station histogram
- Plot NPE, pull etc. by station (done, but not presented)
- Investigate reason for hits recovered on track being peaked up at "zero" distance from the track in both variants of the r-phi fit. Investigate reason for double peak in MINUIT variant
- Reproduce VB mechanical angular momentum plot and demonstrate the issue observed (loss of tracks with zero canonical angular momentum) using MAUS 2.7
- Demonstrate using VB selection etc. that the effect is absent in the MINUIT variant of MAUS 2.9
- With KL, review s-z algorithm

CH: track fit:

- With CR/DR, establish reasons for differences between p-value in versions 2.8.5 and 2.9.0
- Check Highland and Bethe against what is implemented in GEANT
- Study p-value: split up contributions to p-value shape using MC and study shape in data, e.g. is there an error in the resolution per plane, handling of MCS, handing of energy loss, magnetic field, …
- Repeat study that was done to investigate whether field integration (e.g. using Runge Kutta) is required to compensate for magnetic field non-uniformity
- Make study of magnetic-field alignment with a view to establishing whether the present algorithm is sufficiently insensitive to reasonable assumptions of

maximum field-misalignment