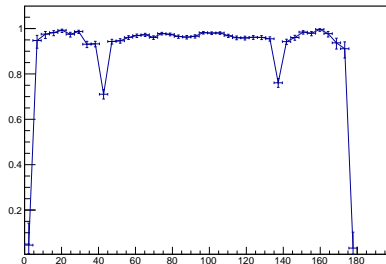
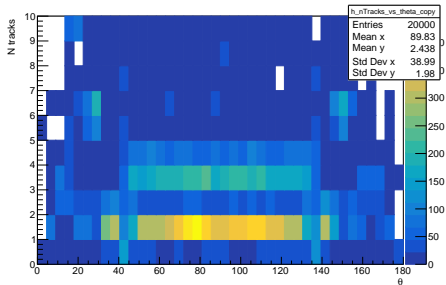


# Seeding PR

The screenshot shows a GitHub pull request interface. At the top, there's a search bar and a 'Sign in / Register' button. The main header shows the repository path 'EIC > Project Juggler > Merge requests > 1494'. The title of the pull request is 'Updated ACTS seeding code fixing multiple issues'. A blue 'Code' button is visible. Below the title, it says 'Yue Shi Lai requested to merge seeding-epic into main 1 week ago'. There are navigation tabs for 'Overview 2', 'Commits 5', 'Pipelines 5', and 'Changes 1'. The description of the pull request is: 'Avoid NaN and std::bad\_alloc inside ACTS during the grid creation, due to specific pseudorapidity coverage, field strength, and minimum pT; custom association of hit to tracking surfaces; additional memory debugging checks'. It then states 'The following issues with the previous code are addressed:' followed by a bulleted list of three items. On the right side, there are sections for 'Assignee' (Wouter Deconinck), 'Reviewer' (Wouter Deconinck), 'Labels' (None), 'Milestone' (None), 'Time tracking' (No estimate or time spent), 'Lock merge request' (Unlocked), and '2 participants'.

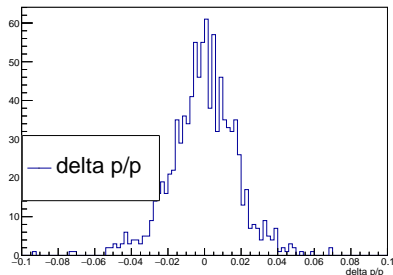
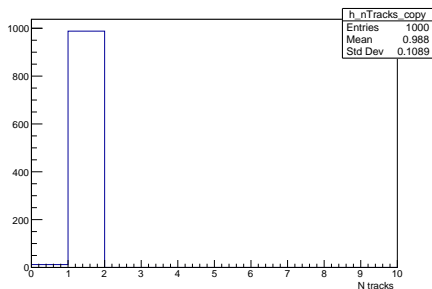
- [https://eicweb.phy.anl.gov/EIC/juggler/-/merge\\_requests/494](https://eicweb.phy.anl.gov/EIC/juggler/-/merge_requests/494)
- Merge is essentially ready, probably require some talking-to-people intervention
- For Juggler as of ACTS 19.9

# Status



- Again 1–2 GeV/c
- Maximum seeds per space point middle set to 2 (minimum not yielding a poor efficiency)
- Mostly 1 seed/track, but some 3 or 4 seeds/track
- Can potentially be optimized at the cost of forward and intermediate region performance
- Observation is that this is a moving target from ACTS to ACTS version, maybe a issue with binned seeding

# Forward performance



- 1–2 GeV/c and  $2 < \eta < 2.5$
- With the current parameters, forward is highly efficient and 1 seed/track
- $\Delta p/p$  (ir-)resolution appear better than 2% (and centered)

# Additional status notes

- Current performance is about the best seen
- Mystifying is still the ACTS version-to-version behavior changes
- A first run with Valgrind reveal memory bugs in the BinnedSPGroup (binned seeding)
  - Maybe the best course is to move to the unbinned seeder? (Recommendation by ACTS developer and Joe Osborne/sPHENIX)
  - Juggler appears not to be frequently debugged this way, a few seemingly other bugs, and a flood of possible false positives (1000 events produce a log file 38 MB large).
- Dimitri Romanov volunteered to make initial port to EICrecon based off this version (to be merged)