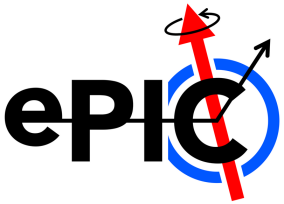


Angular Resolutions at the DIRC Update

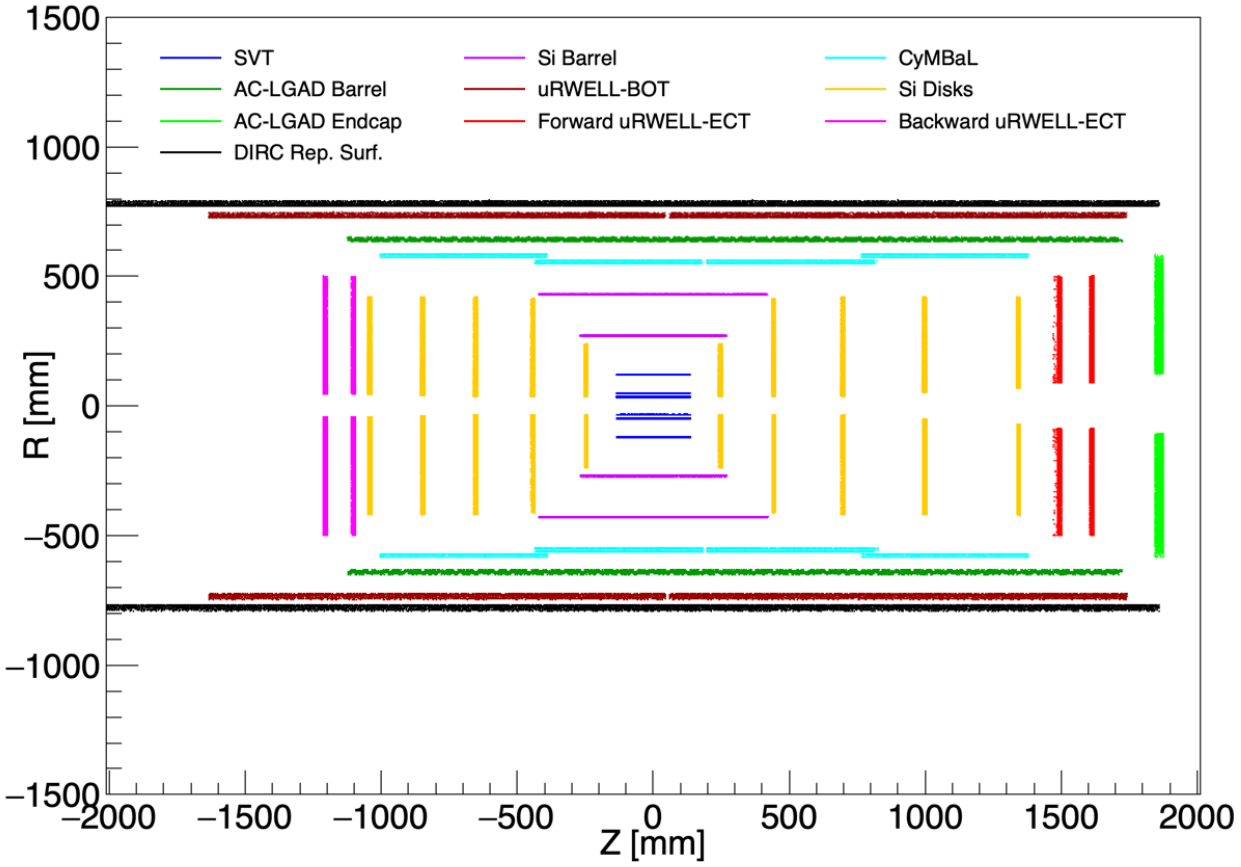
Matt Posik
Temple University

Simulation Details

- ePIC: 25.04.1
- EICrecon: v1.24.0
- π^- single particle
- Fixed momenta values
- $\Delta\theta = 2^o,\ \Delta\phi = 360^o$
- Results shown for $\eta = -0.05$
- DIRC Reference Surface

  R = 770.5 mm

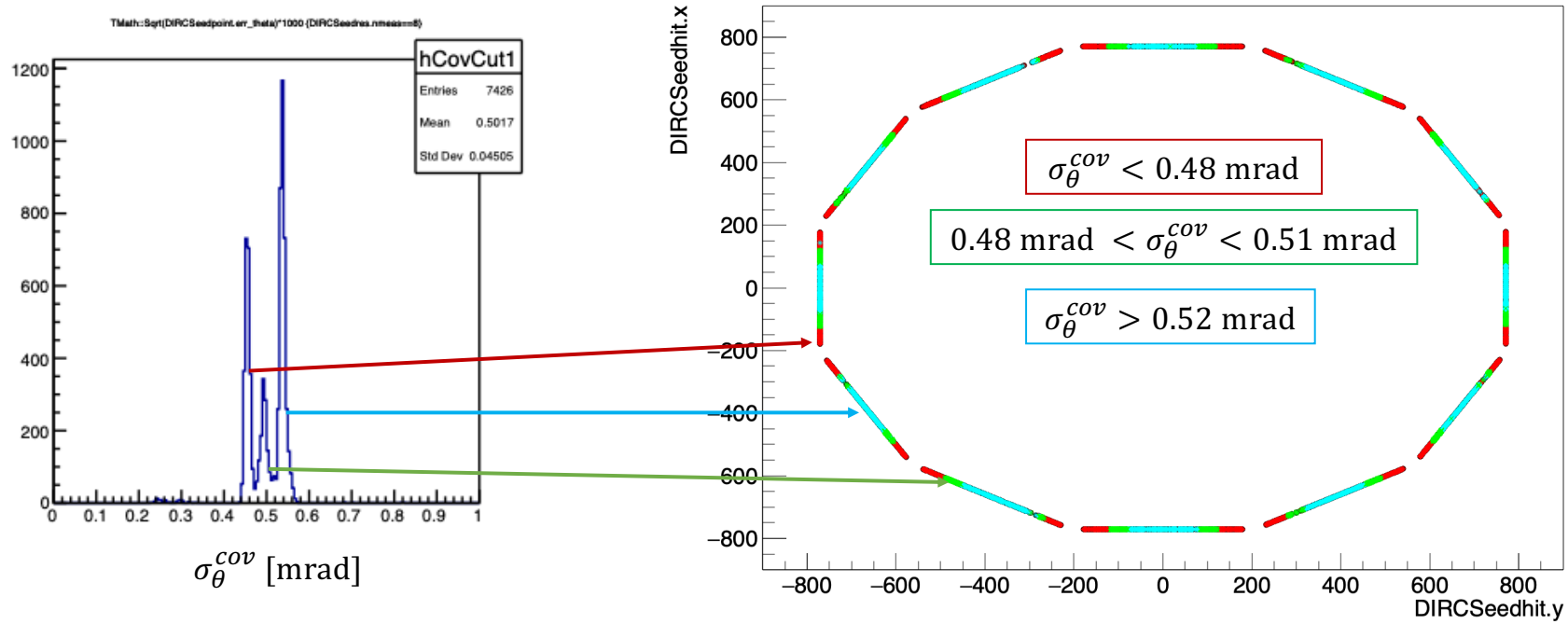
➢ All resolutions presented are with respect to R = 770.5mm surface



❖ Follow up from previous presentation

Resolutions: Cov. Structure

- Structure seen in covariance error is correlated to position on DIRC reference surface



Material Map Check

- Generate my own map using same geometry as the tagged release

Craterlake_material_map.yml

```yaml
# This contains all geometry to be used in the material map
ebeam: 5
pbeam: 41
features:
  beampipe:
  tracking:
    definitions_craterlake:
    vertex_barrel:
    silicon_barrel:
    mpgd_barrel:
    support_service_craterlake:
    mpgd_outerbarrel:
    mpgd_forward_endcap:
    mpgd_backward_endcap:
    silicon_disks:
    tof_barrel:
    tof_endcap:
    dirc_ref_surface:
  pid:
    dirc:
    pfrich:
    drich:
  ecal:
    forward_homogeneous:
    forward_insert_homogeneous:
  hcal:
    lfhcal_with_space_for_insert:
    forward_insert:
  far_forward:
    default:
  far_backward:
    default:
```

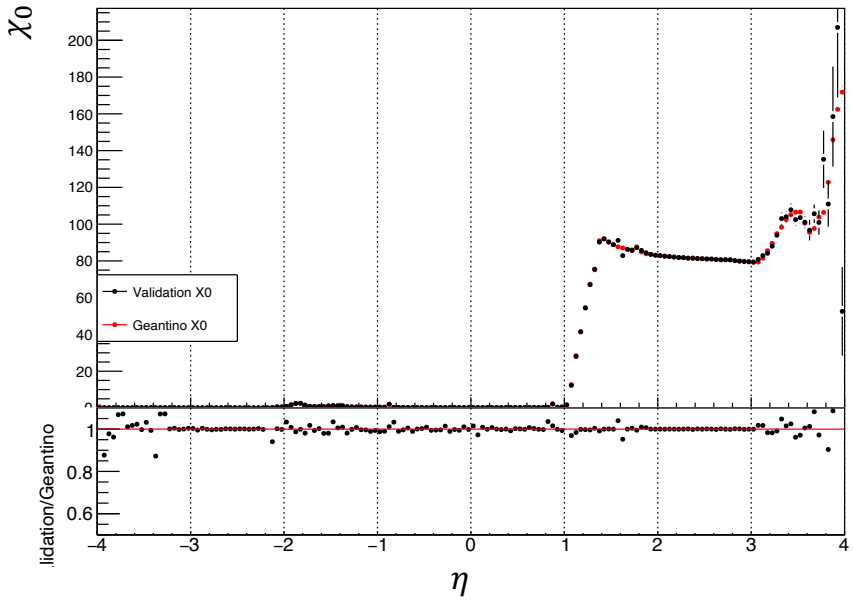
Craterlake_my_material_map.yml

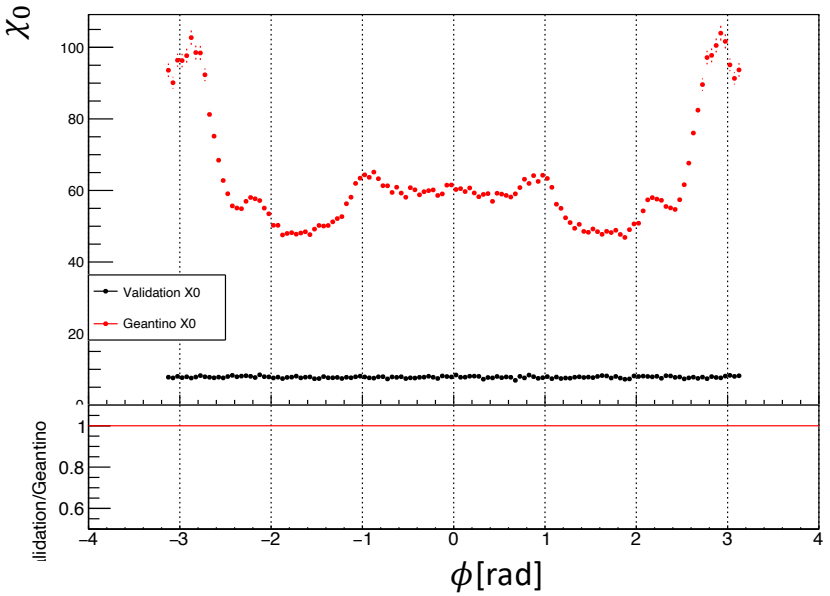
```yaml
features:
  beampipe:
  fields:
    marco:
  tracking:
    definitions_craterlake:
    vertex_barrel:
    silicon_barrel:
    mpgd_barrel:
    support_service_craterlake:
    mpgd_outerbarrel:
    mpgd_forward_endcap:
    mpgd_backward_endcap:
    silicon_disks:
    tof_barrel:
    tof_endcap:
    dirc_ref_surface:
  pid:
    dirc:
    pfrich:
    drich:
  ecal:
    forward_homogeneous:
    forward_insert_homogeneous:
  hcal:
    lfhcal_with_space_for_insert:
    forward_insert:
  far_forward:
    default:
  far_backward:
    default:
```

Material Map Check

Craterlake_my_material_map

- Good agreement seen in η, but not in ϕ

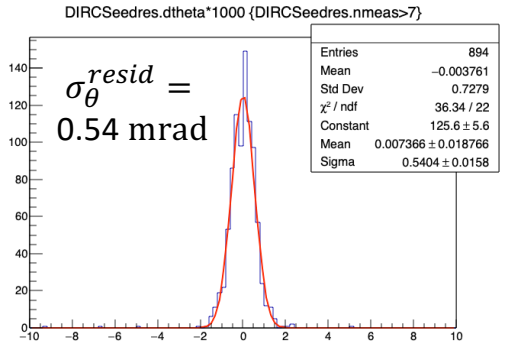


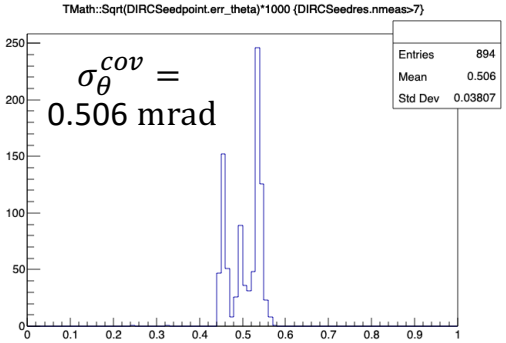


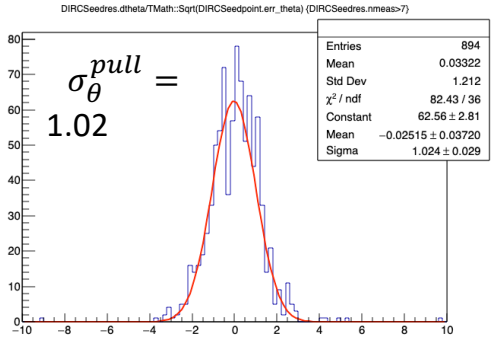
Material Maps: Resolutions

- Agreement between my map and the official one

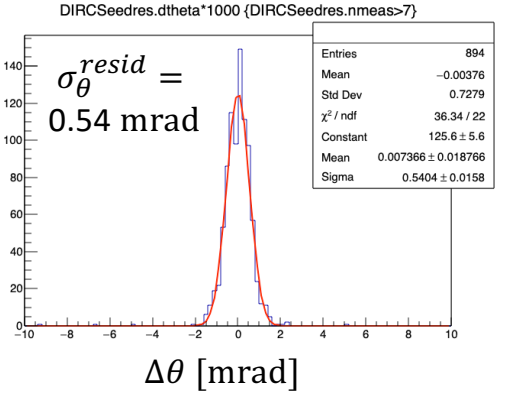
Craterlake_material_map.yml

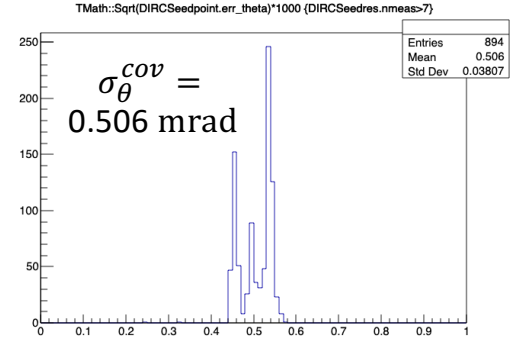


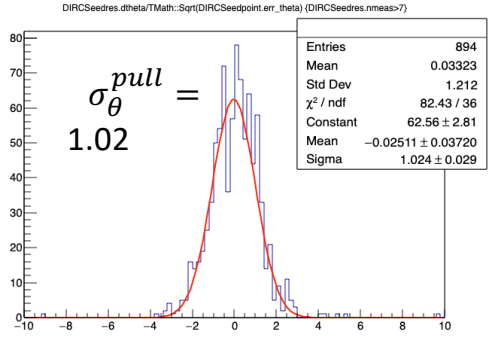




Craterlake_my_material_map.yml



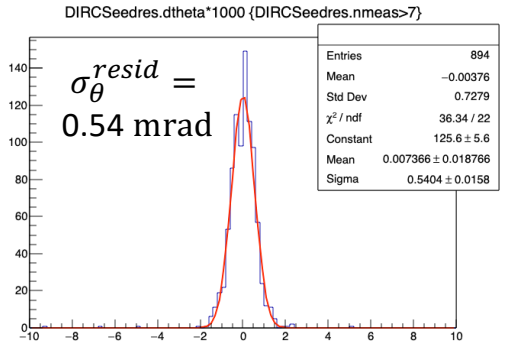


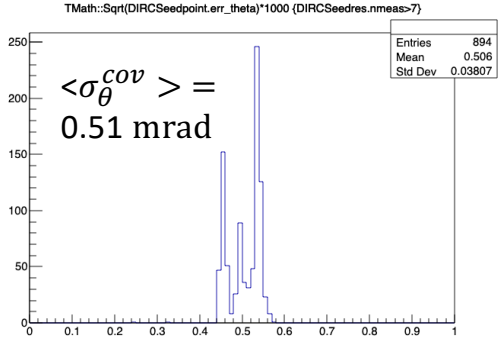


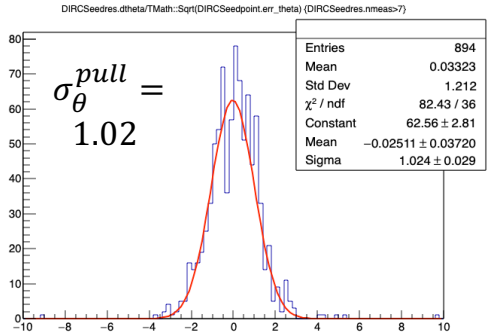
Resolution: µRWELL-BOT Hits

- Removing µRWELL-BOT hit collection from tracking.cc (hits not used in CKF, but material is there) removes peak structure
- Small change in residuals, but large change in covariance errors (?)

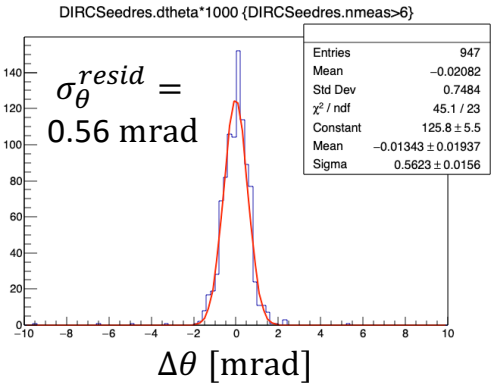
Craterlake_my_material_map.yml

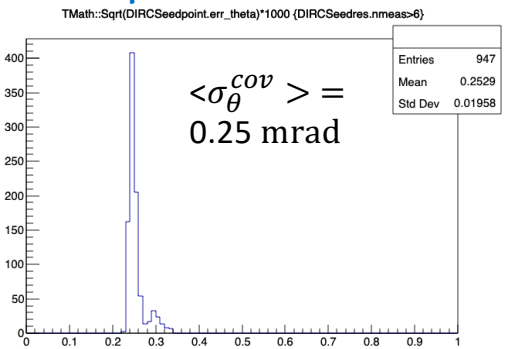


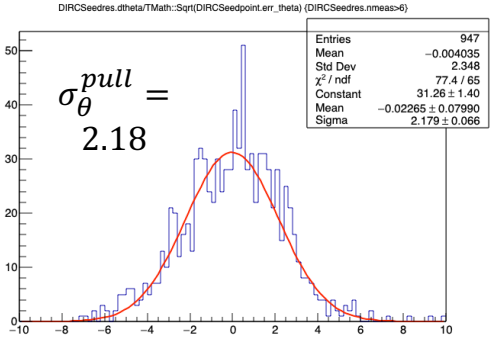




No µRWELL-BOT Hits







Summary

- Structure in covariance errors is correlated to reference surface position.
- Disagreement seen in phi distribution of material map
- When removing μRWELL-BOT from CKF,
  - Covariance error structure changes and shows large decrease in average (~ factor of 2)
  - Small change in residuals