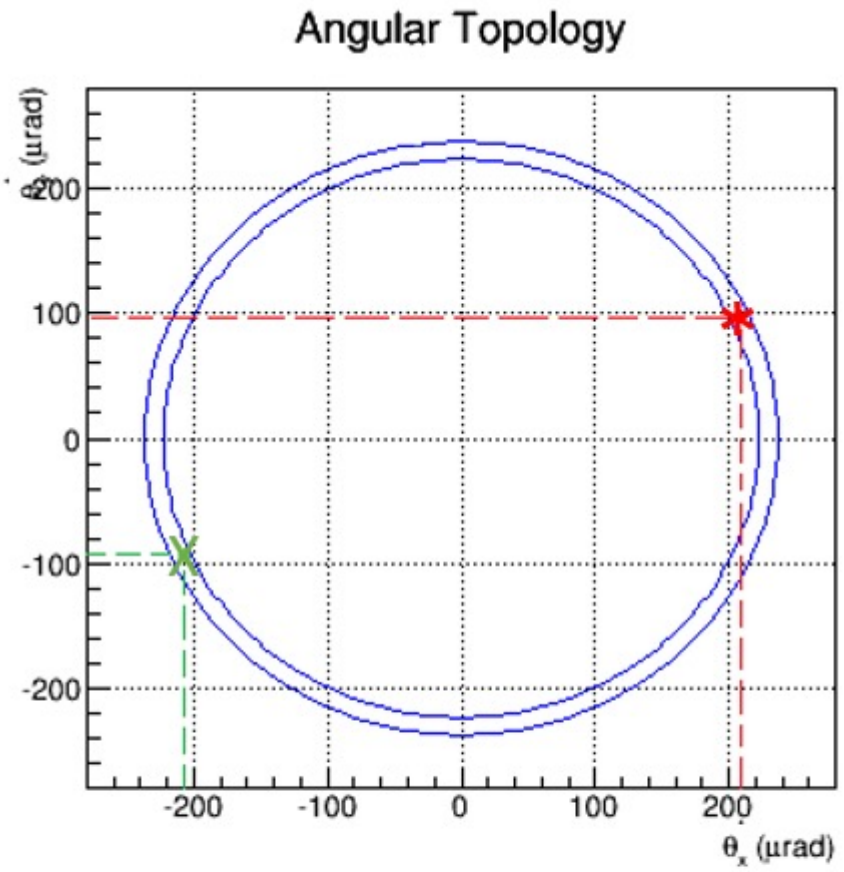
Recoiling protons

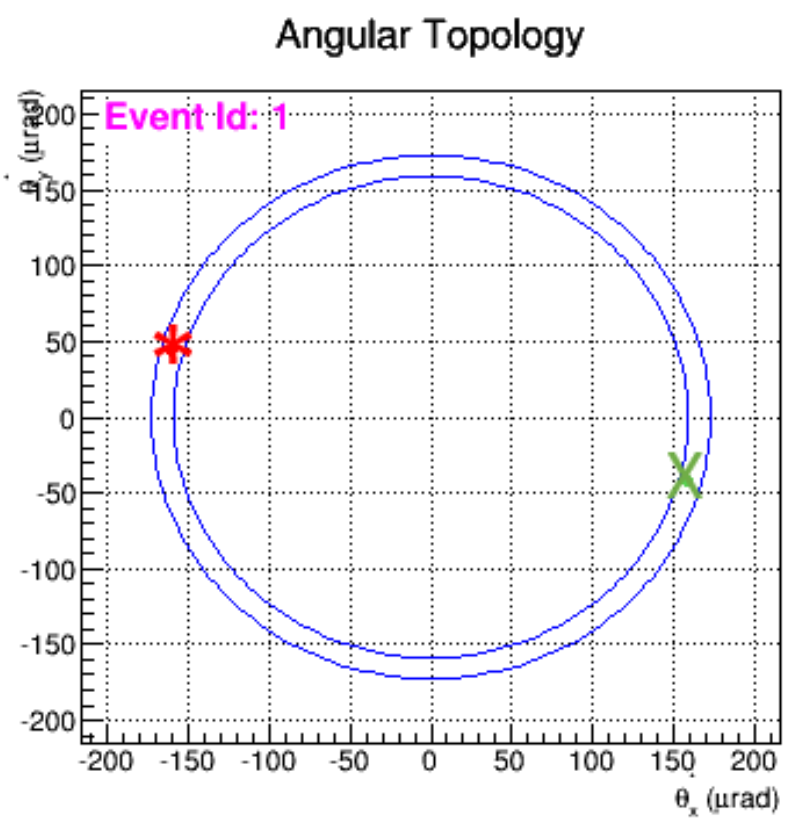
TOTEM proton-scattering events for student analysis

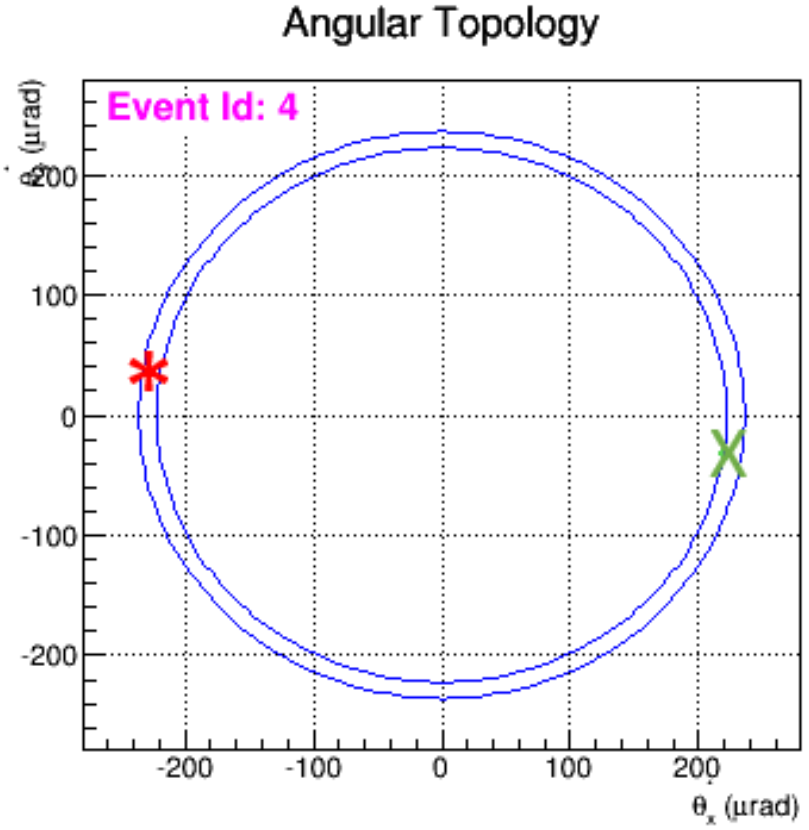


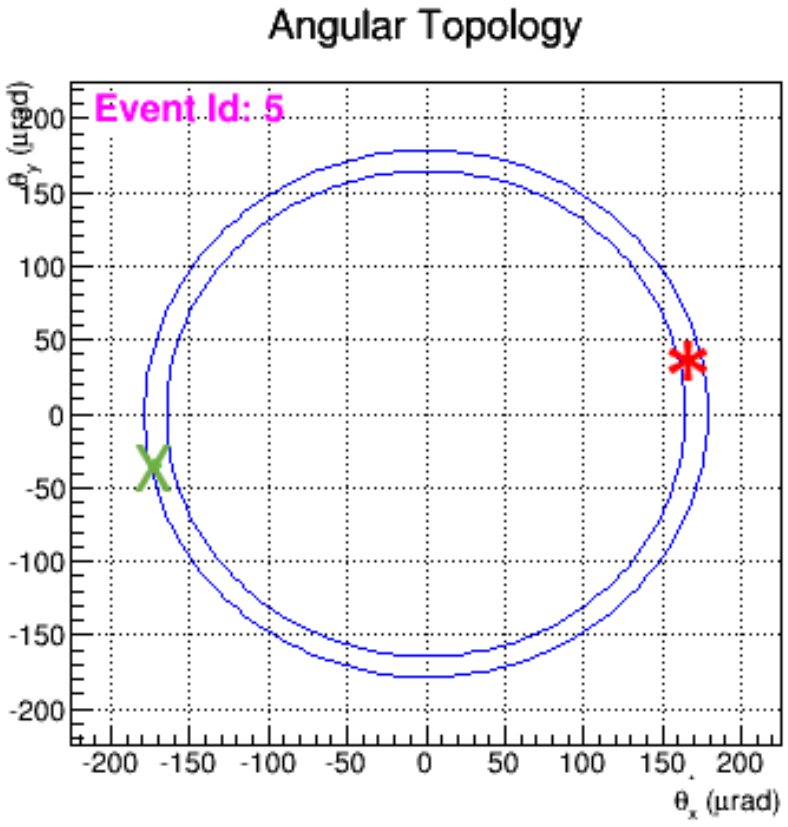
θ_x = 209 μrad θ_x = -208 μrad

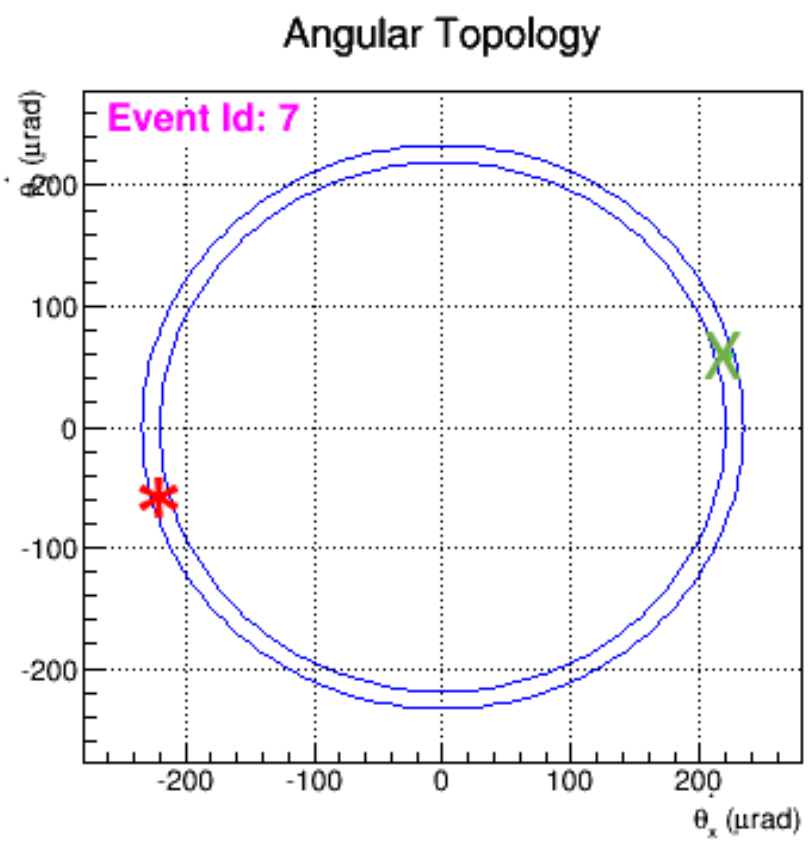
θ_y = 99 μrad θ_y = -92 μrad

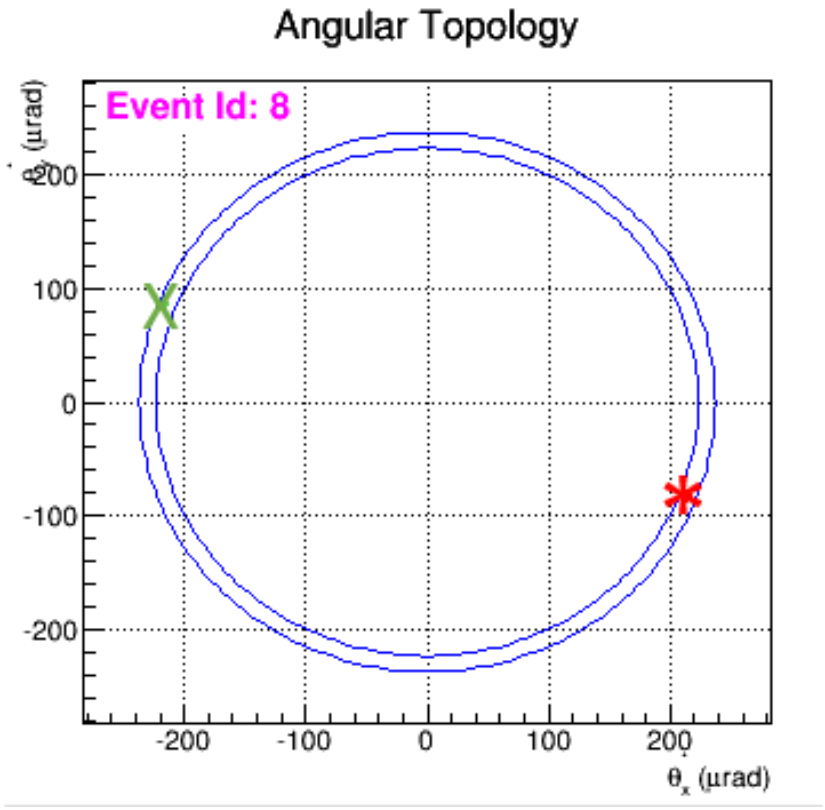
- Find the red star (*) and the green X. Each represents a proton strike on the detector, albeit from different sides of TOTEM.
- Drop a vertical line to read the value of θ_x for both the red star (*) and the green X.
- Drop a vertical line to read the value of θ_y for both the red star (*) and the green X.
- Record *all four values* in your tally sheet.

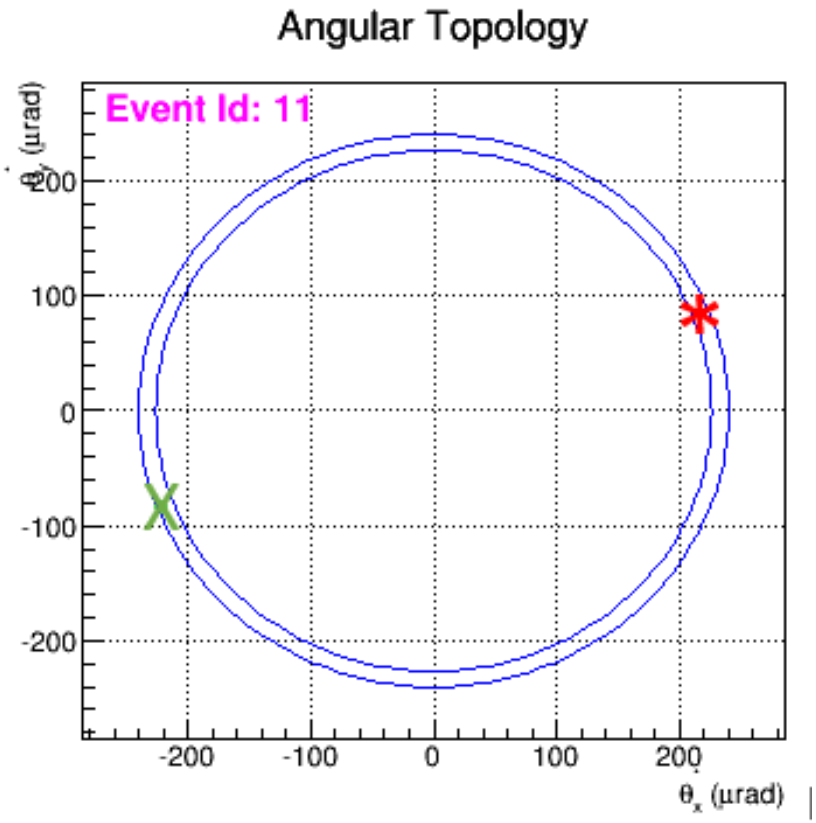

Angular Topology
Event Id: 1
θy (μrad)
θx (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200 -150 -100 -50 0 50 100 150 200

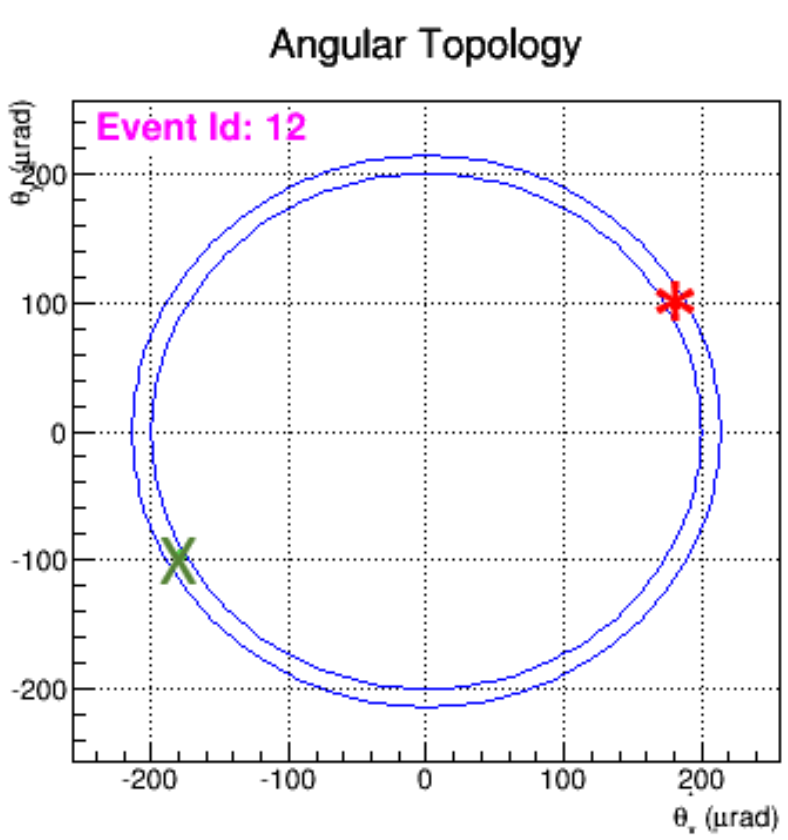

Angular Topology
Event Id: 4
θy (μrad)
θx (μrad)
200
100
0
-100
-200
-200 -100 0 100 200

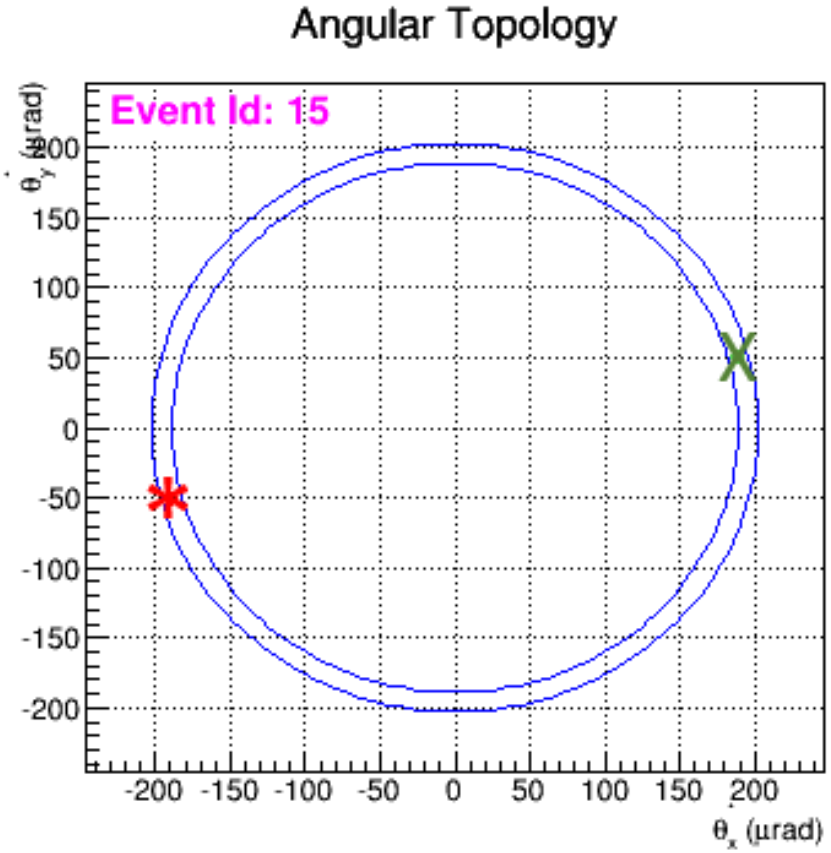

Angular Topology
Event Id: 5
200
150
100
50
0
-50
-100
-150
-200
-200 -150 -100 -50 0 50 100 150 200
θx (μrad)
θy (μrad)

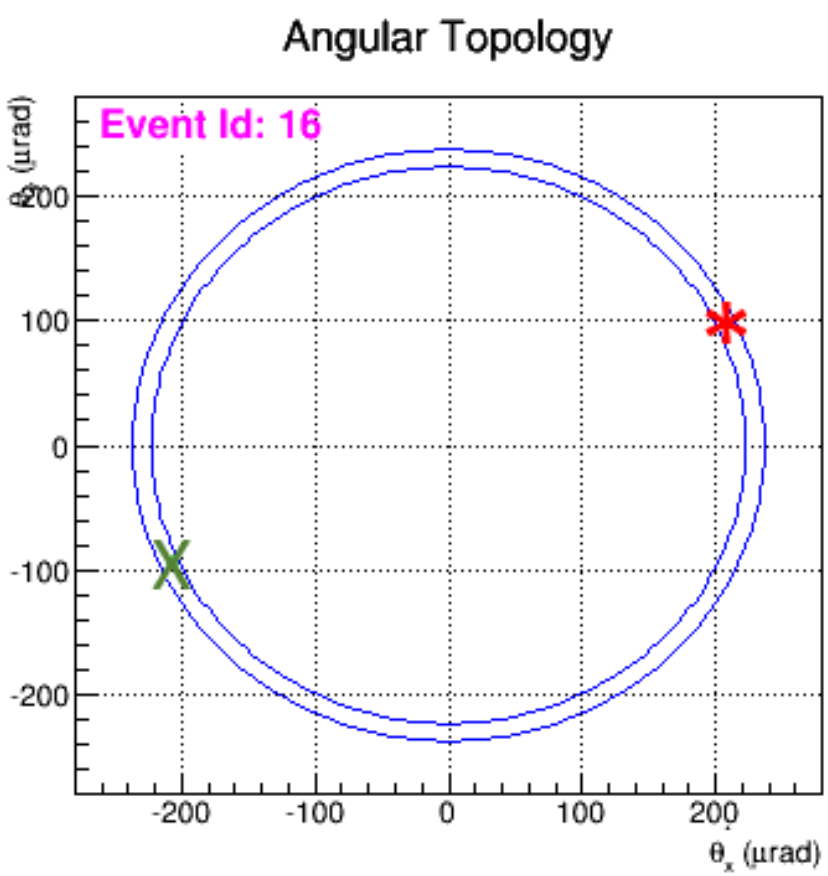

Angular Topology
Event Id: 7
200
100
0
-100
-200
-200 -100 0 100 200
θx (μrad)
θy (μrad)

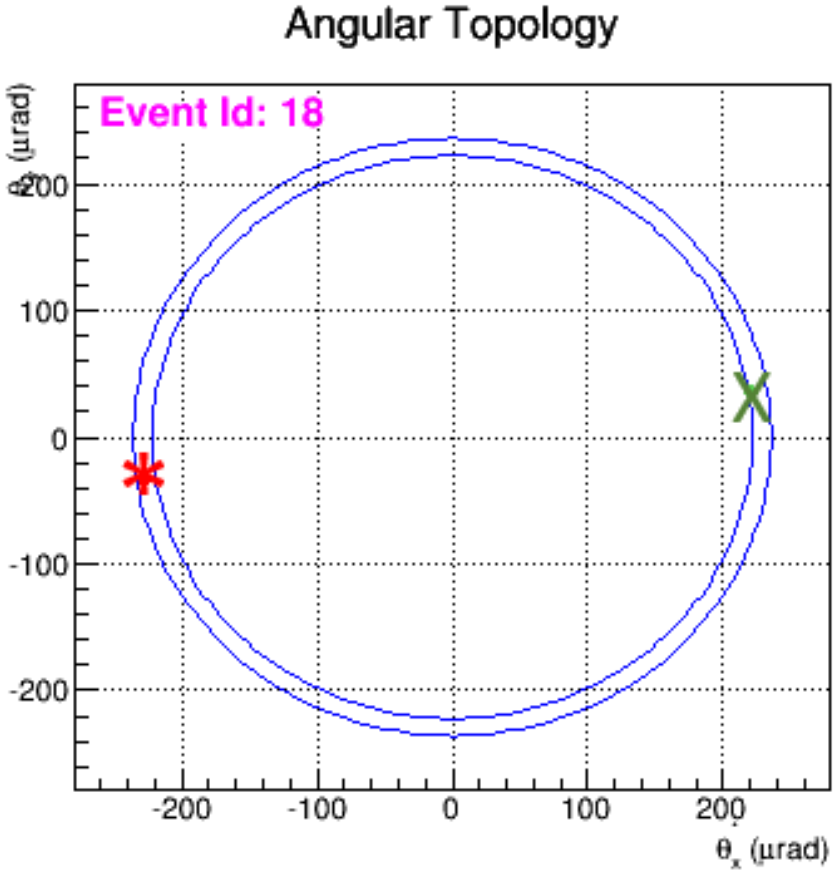

Angular Topology
Event Id: 8
θy (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)

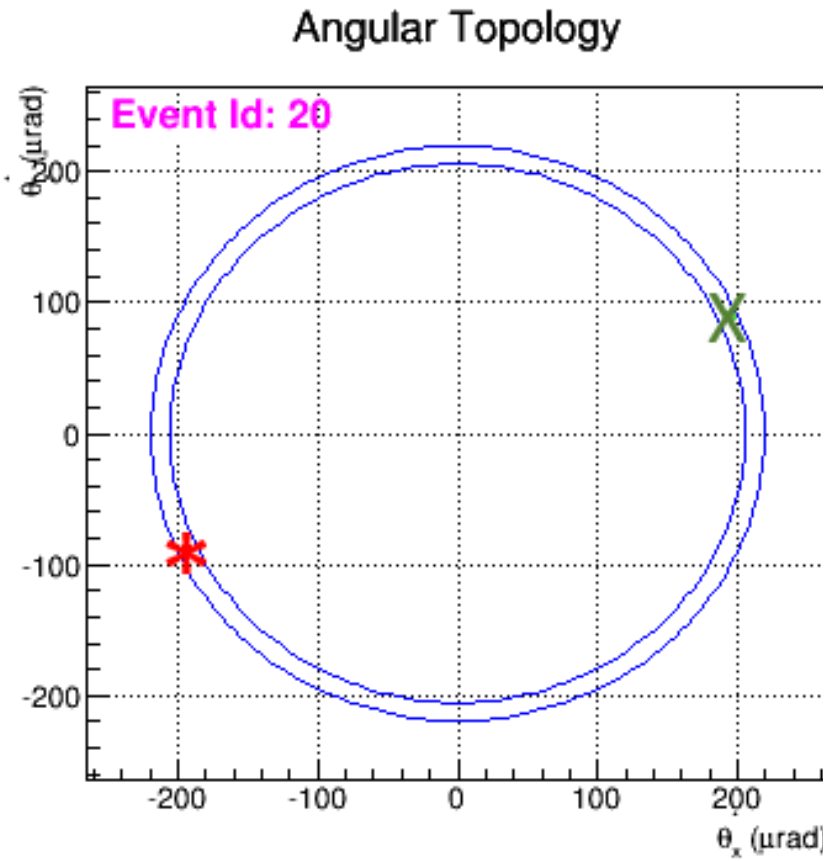

Angular Topology
Event Id: 11
θy (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)

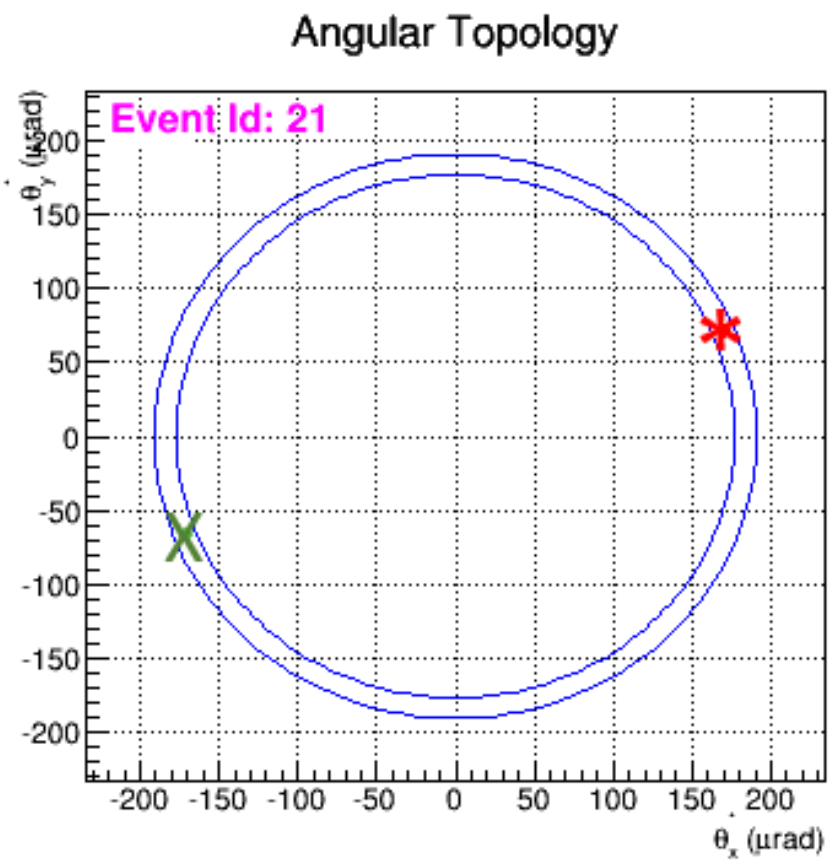

Angular Topology
Event Id: 12
θy (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)

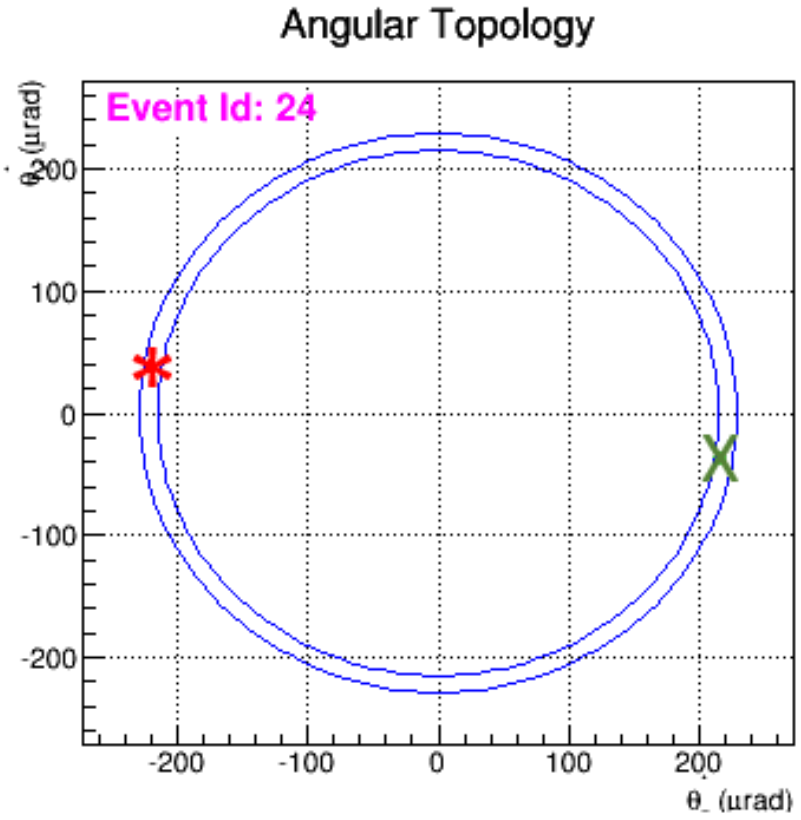

Angular Topology
Event Id: 15
θy (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200 -150 -100 -50 0 50 100 150 200
θx (μrad)

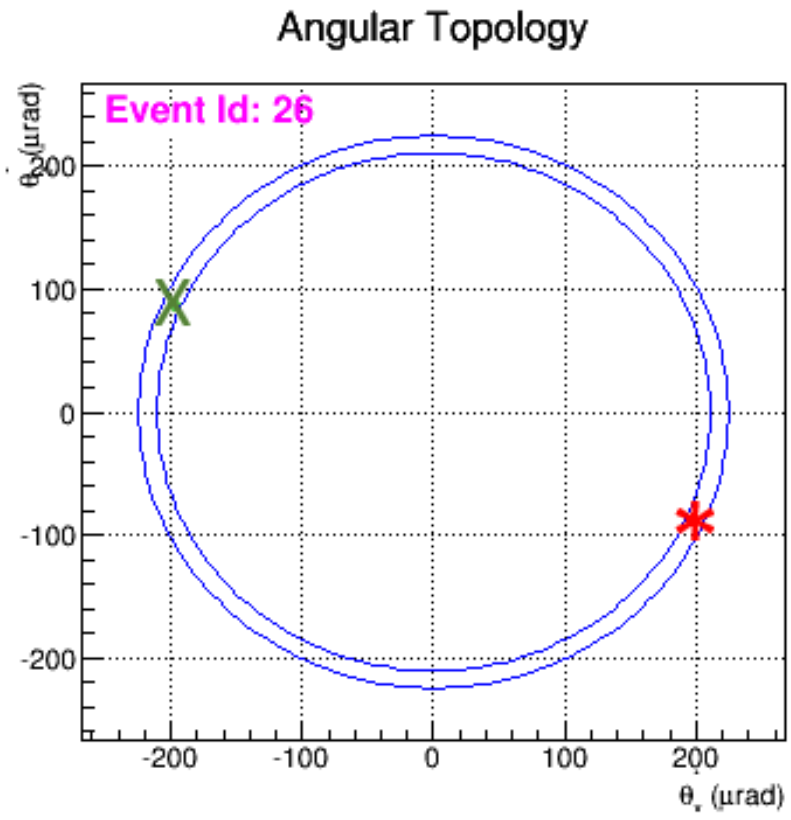

Angular Topology
Event Id: 16
θy (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)

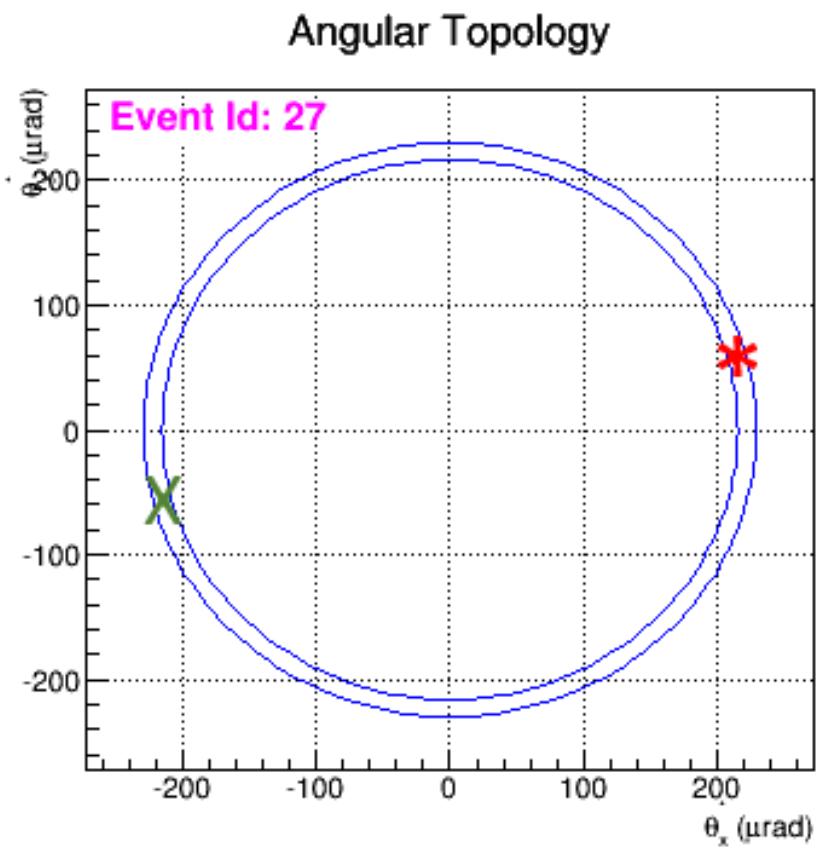

Angular Topology
Event Id: 18
θy (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)

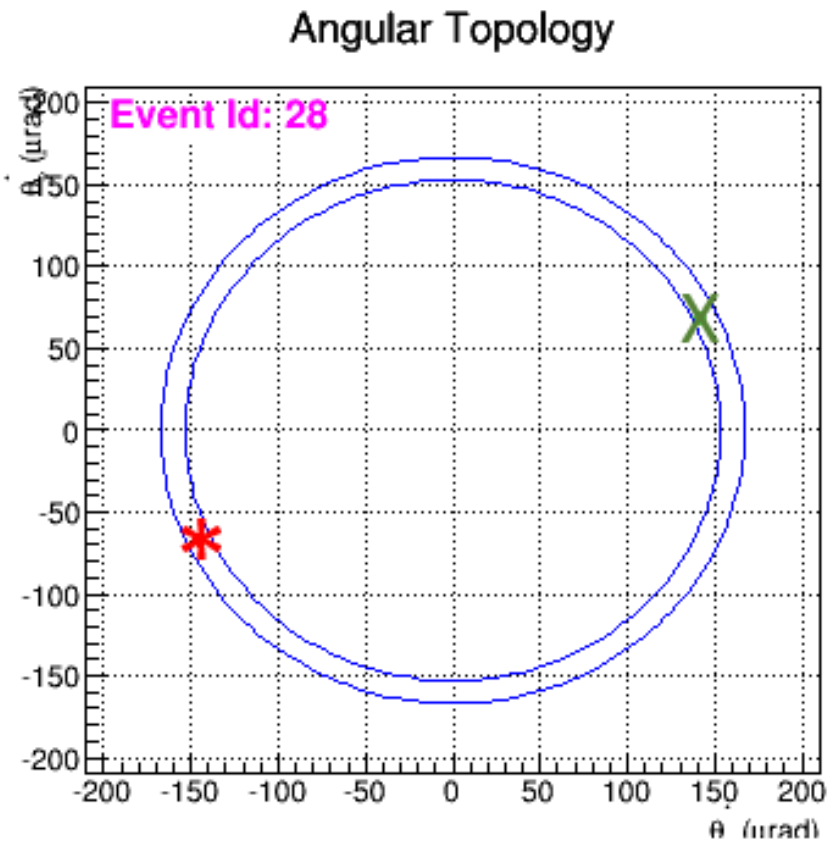

Angular Topology
Event Id: 20
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)

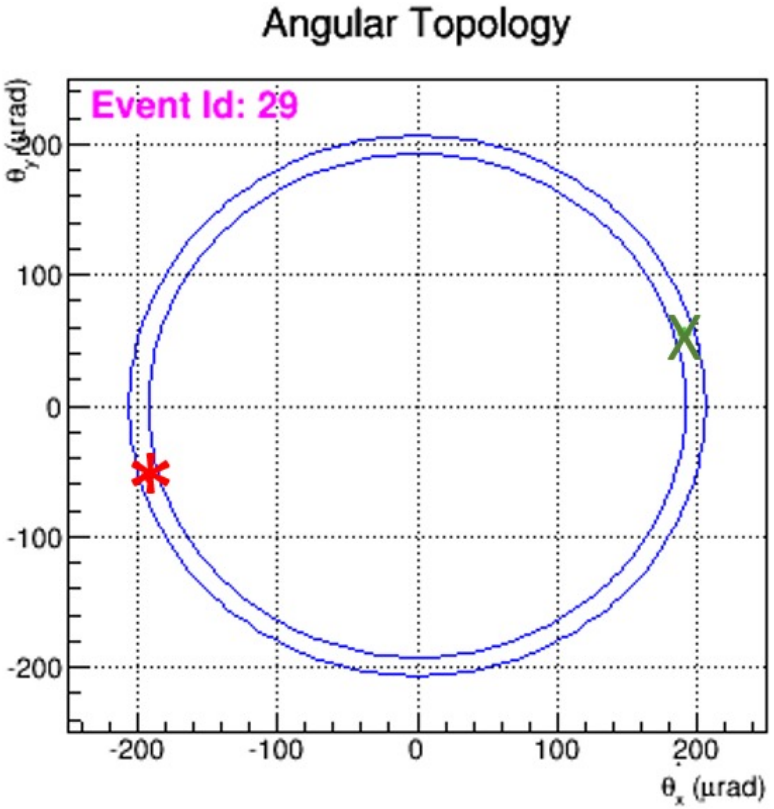

Angular Topology
Event Id: 21
200
150
100
50
0
-50
-100
-150
-200
-200
-150
-100
-50
0
50
100
150
200
θx (μrad)

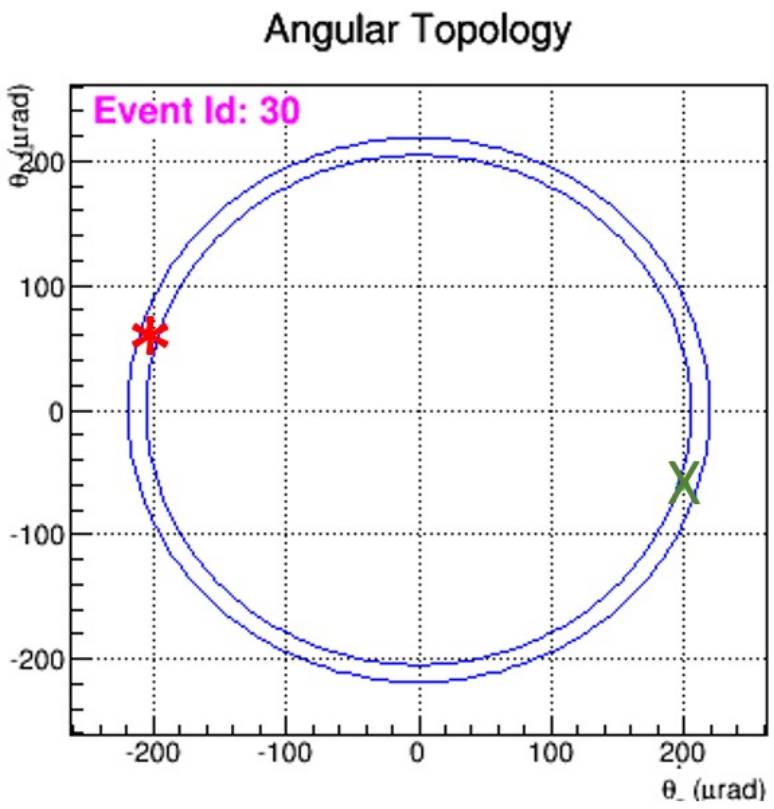

Angular Topology
Event Id: 24
θ+ (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θ- (μrad)

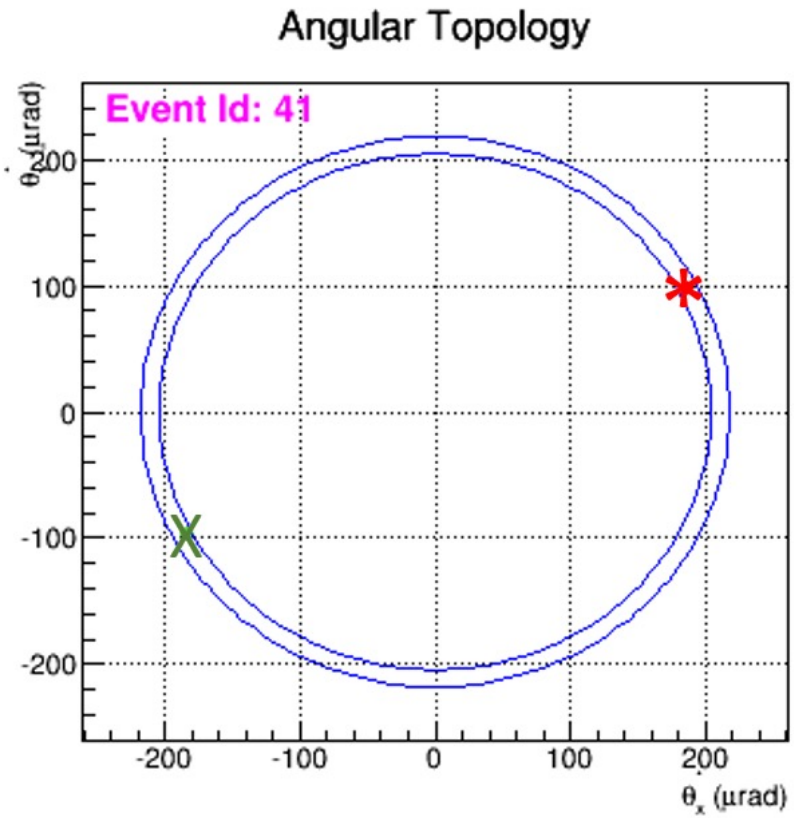

Angular Topology
Event Id: 26
θ+ (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θ- (μrad)

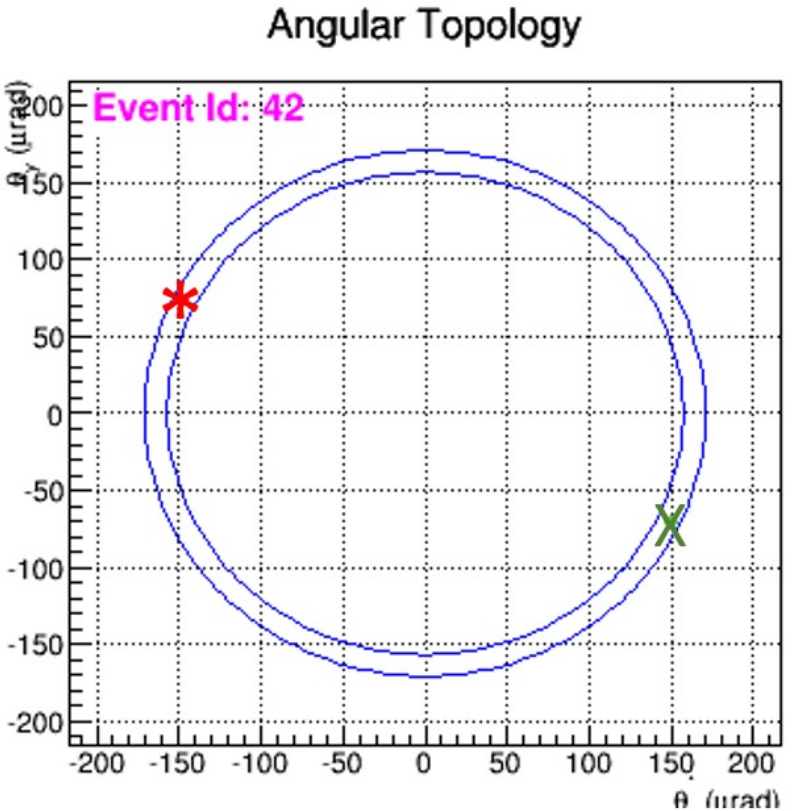

Angular Topology
Event Id: 27
θy (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)

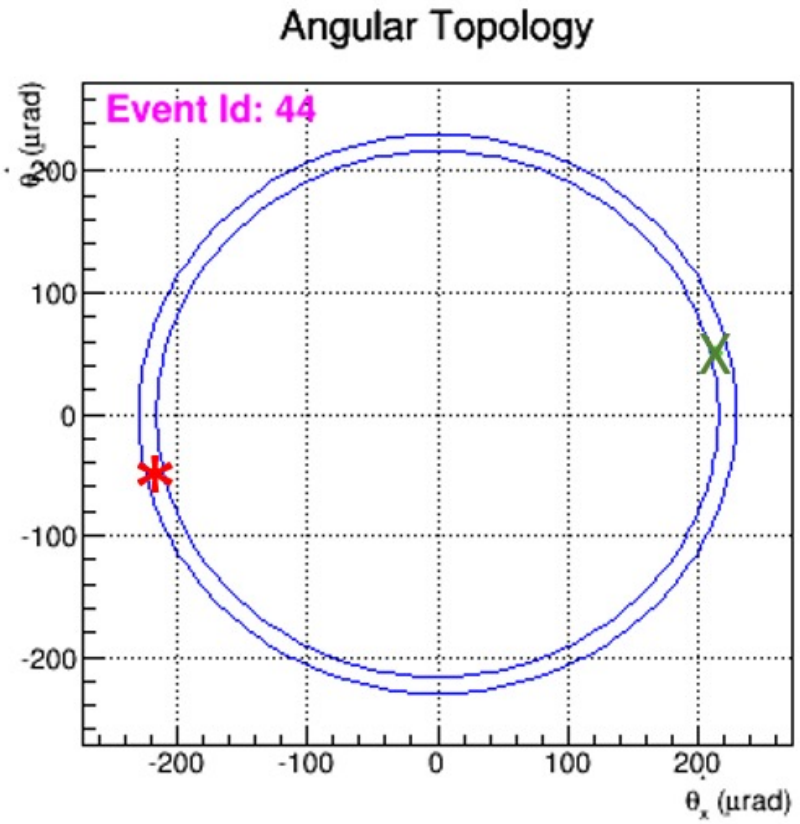

Angular Topology
Event Id: 28
θy (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200
-150
-100
-50
0
50
100
150
200

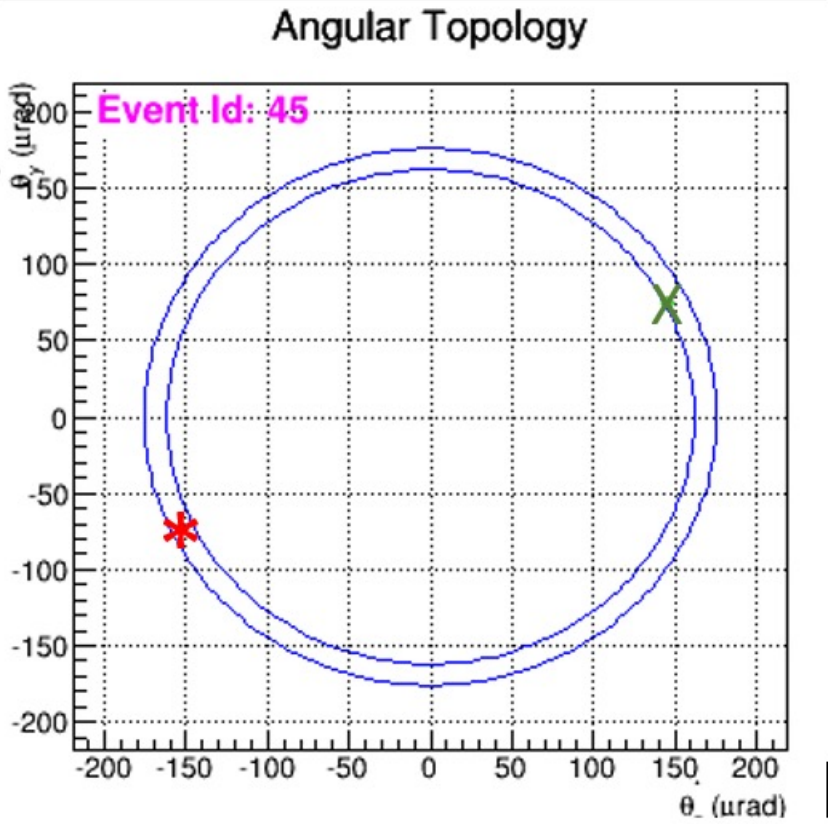

Angular Topology
Event Id: 29
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)
θy (μrad)

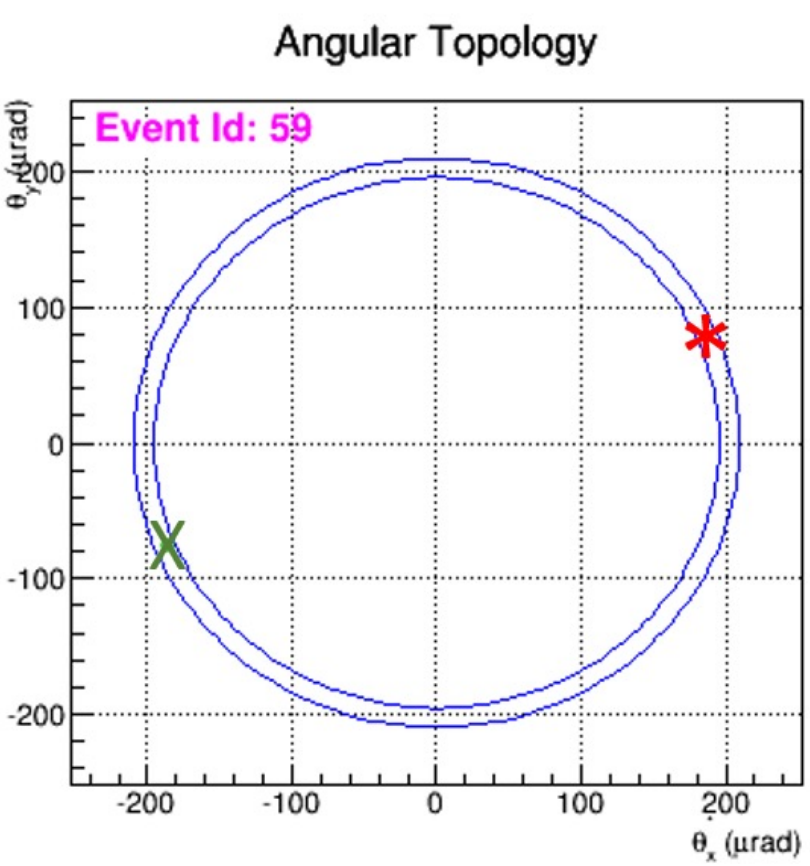

Angular Topology
Event Id: 30
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)
θy (μrad)

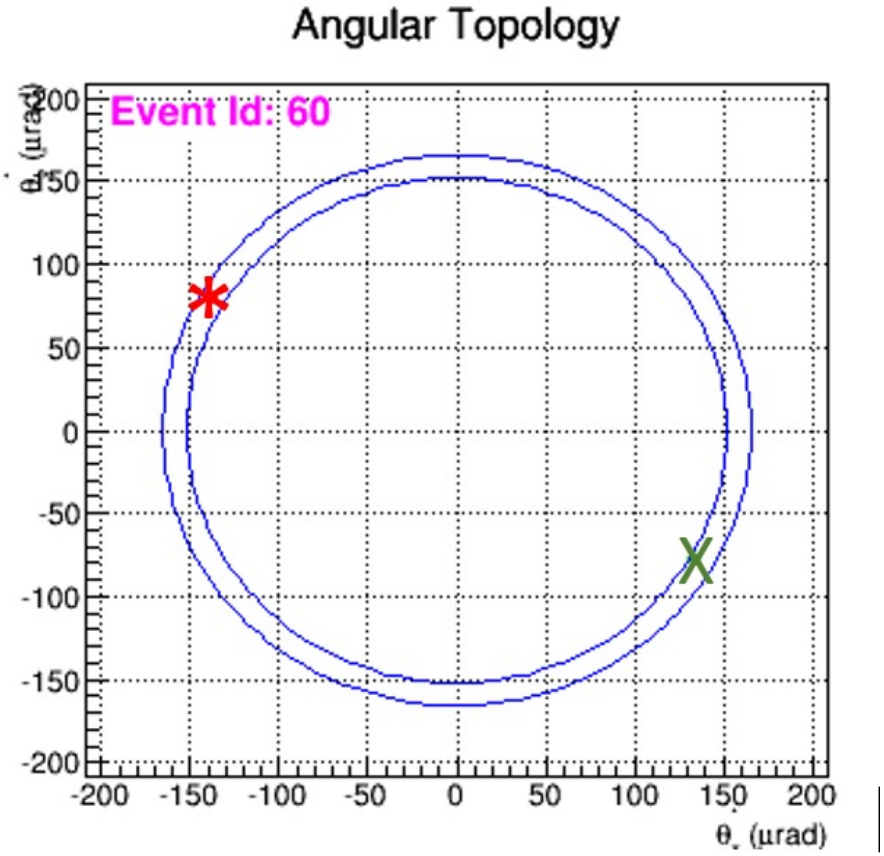

Angular Topology
Event Id: 41
θy (μrad)
θx (μrad)
200
100
0
-100
-200
-200
-100
0
100
200

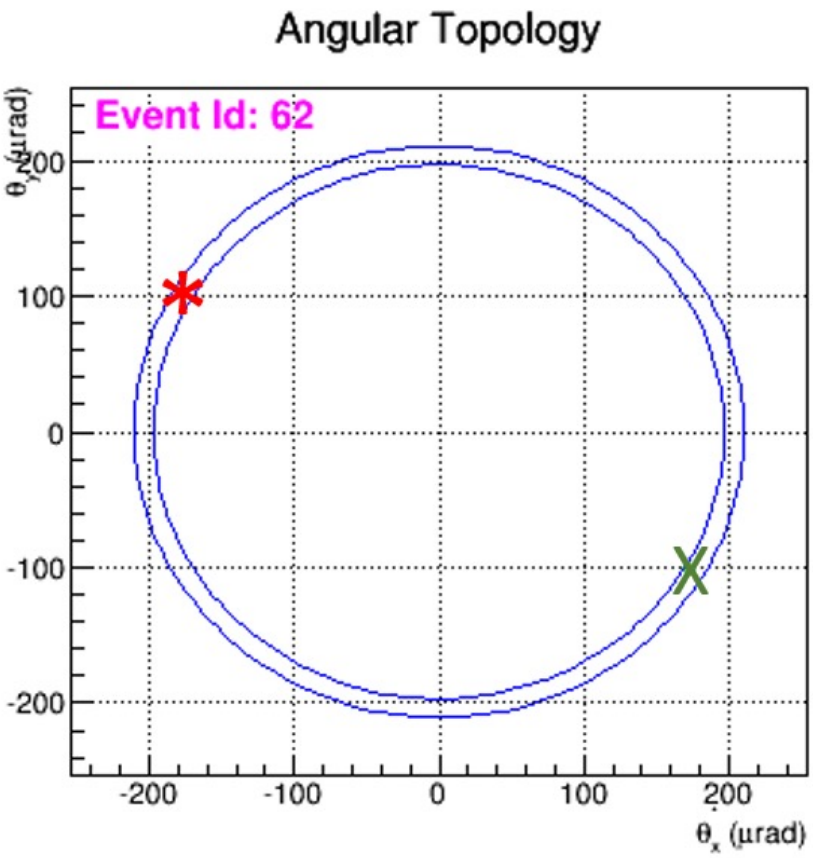

Angular Topology
Event Id: 42
θy (μrad)
θx (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200
-150
-100
-50
0
50
100
150
200

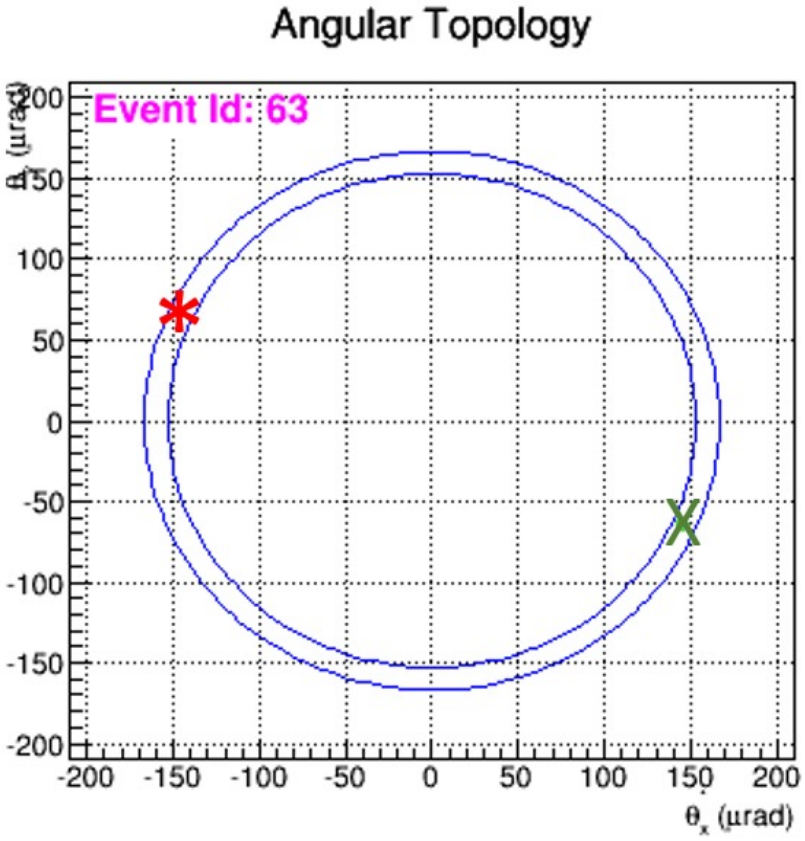

Angular Topology
Event Id: 44
θy (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)

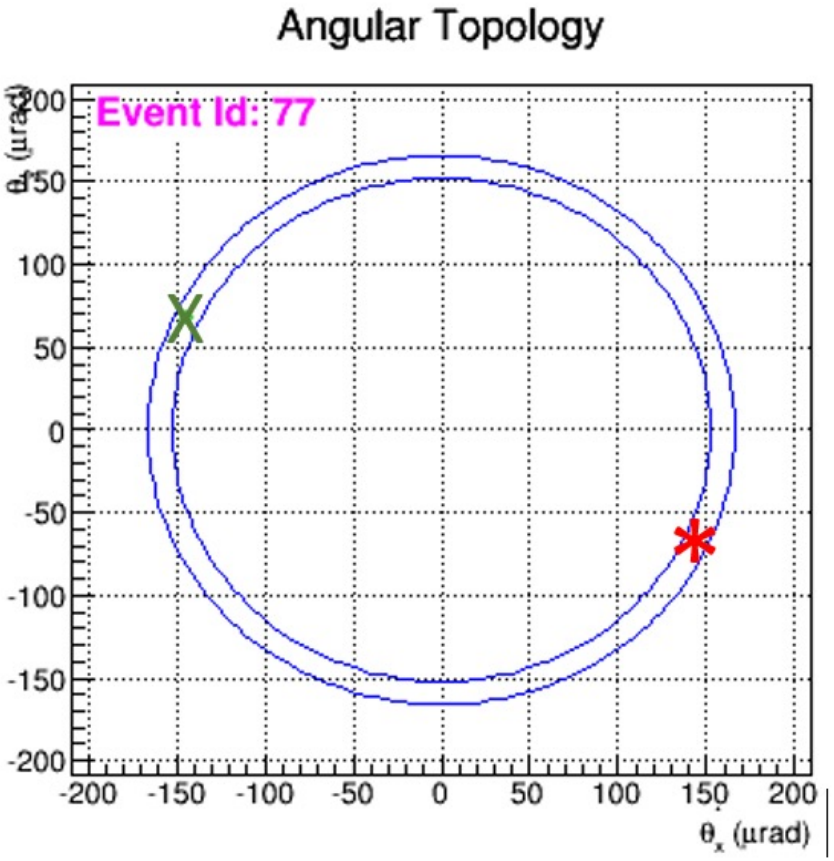

Angular Topology
Event Id: 45
θy (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200
-150
-100
-50
0
50
100
150
200
θx (μrad)

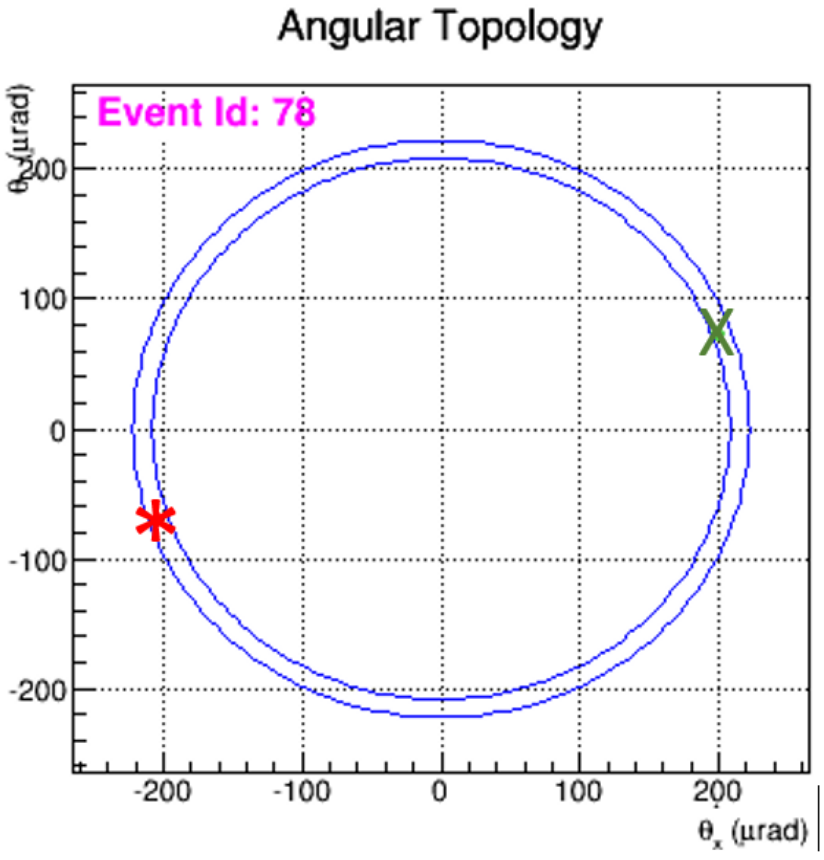

Angular Topology
Event Id: 59
θy (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)

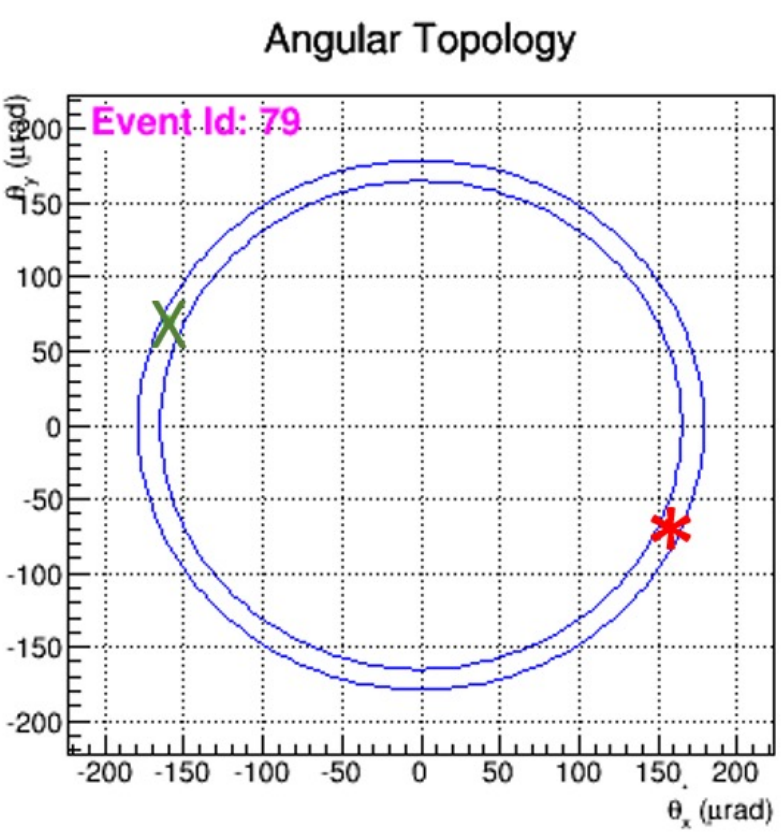

Angular Topology
Event Id: 60
θy (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200
-150
-100
-50
0
50
100
150
200
θx (μrad)

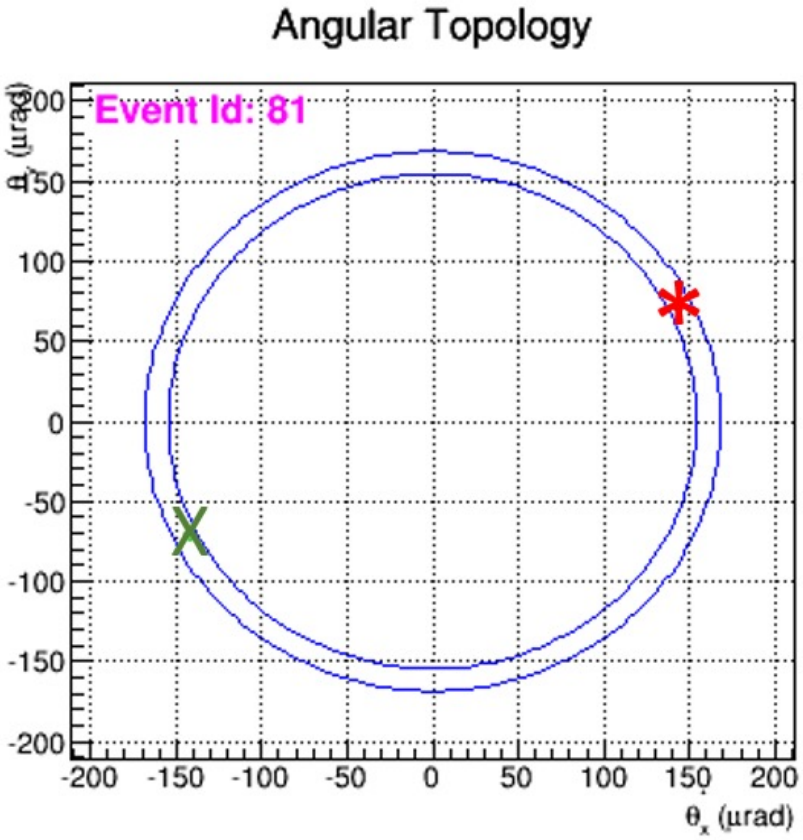

Angular Topology
Event Id: 62
θy (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)

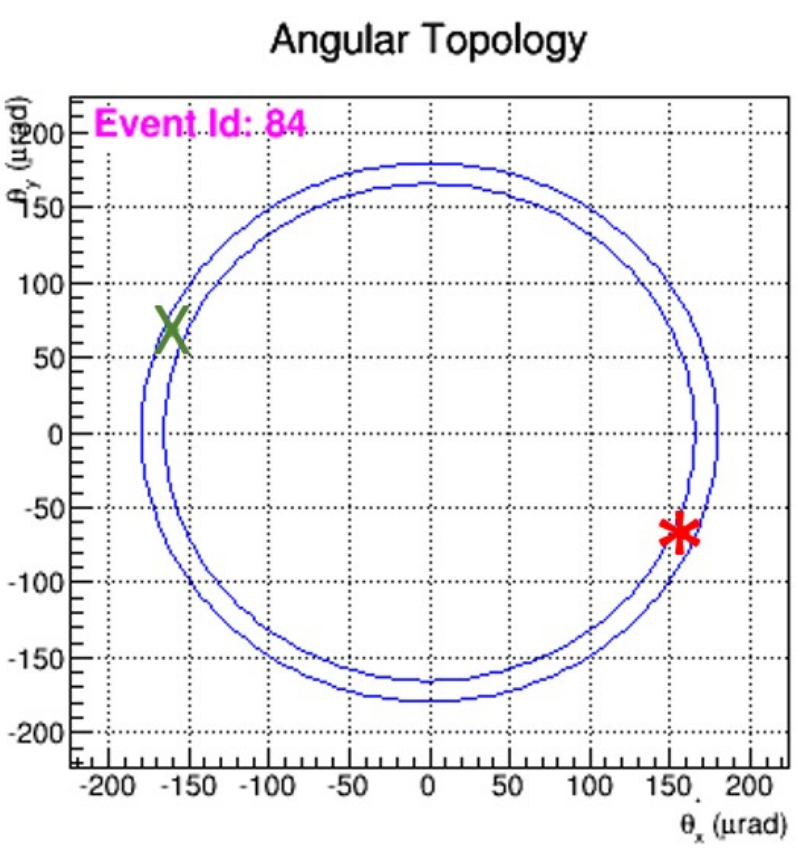

Angular Topology
Event Id: 63
θy (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200
-150
-100
-50
0
50
100
150
200
θx (μrad)

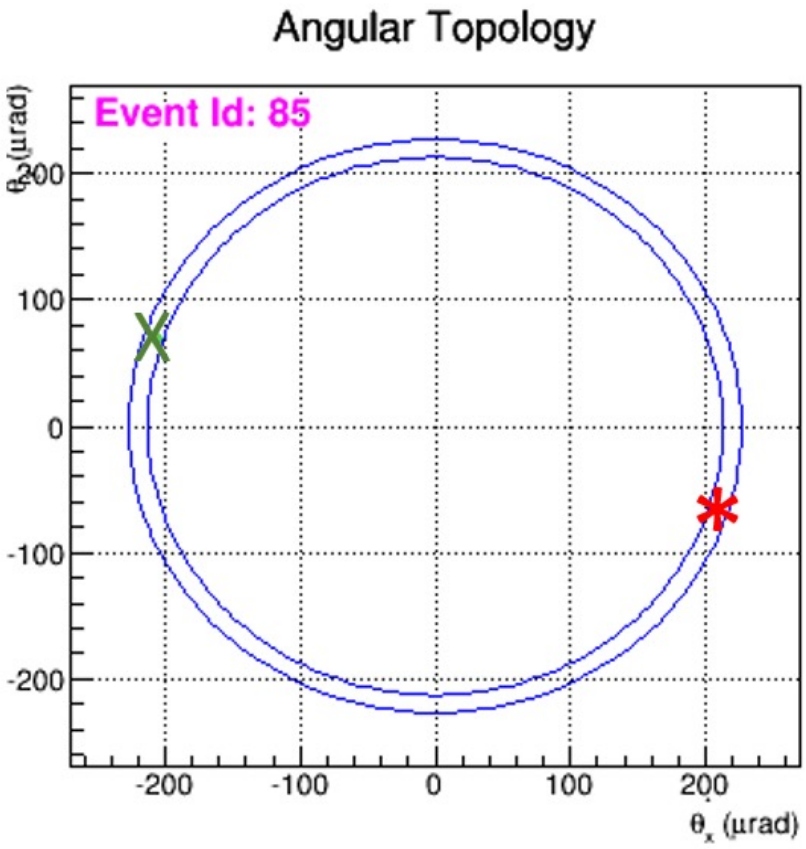

Angular Topology
Event Id: 77
θy (μrad)
θx (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200 -150 -100 -50 0 50 100 150 200

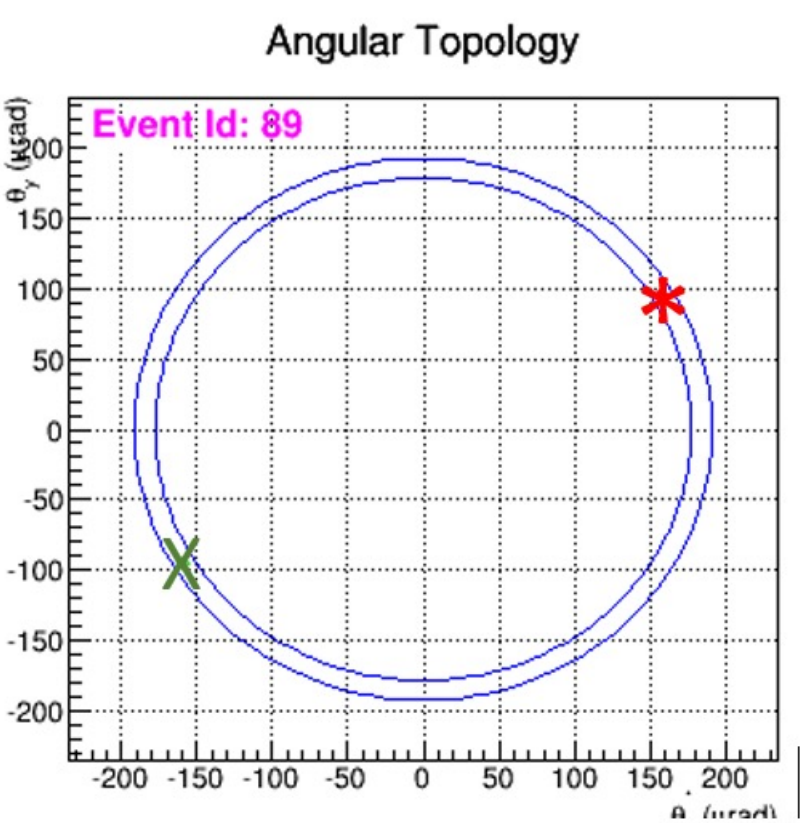

Angular Topology
Event Id: 78
θy (μrad)
θx (μrad)
200
100
0
-100
-200
-200 -100 0 100 200

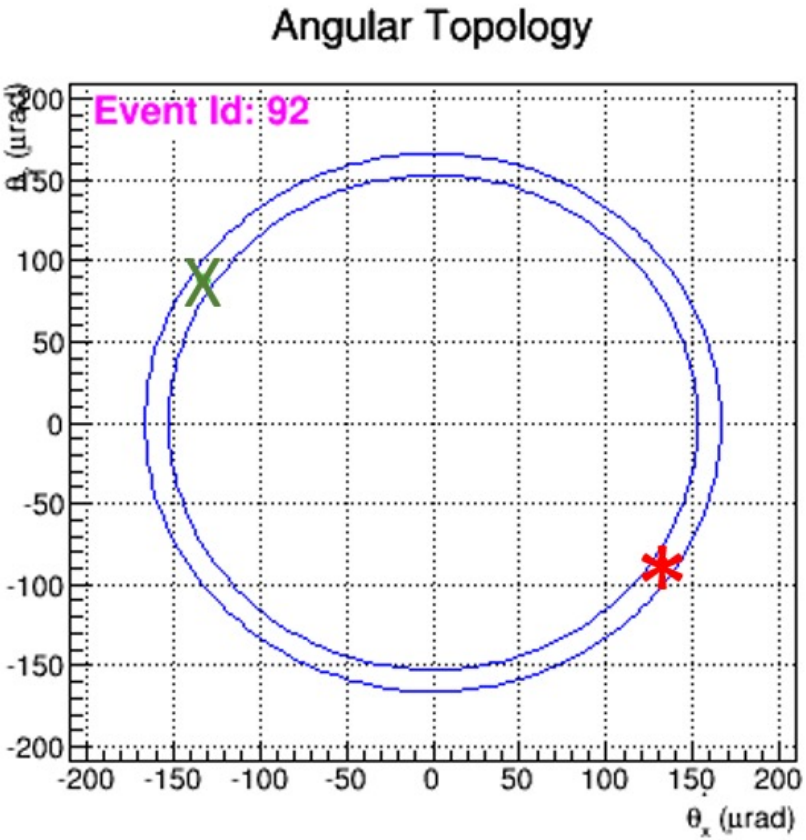

Angular Topology
Event Id: 79
θy (μrad)
θx (μrad)
200
150
100
50
0
-50
-100
-150
-200

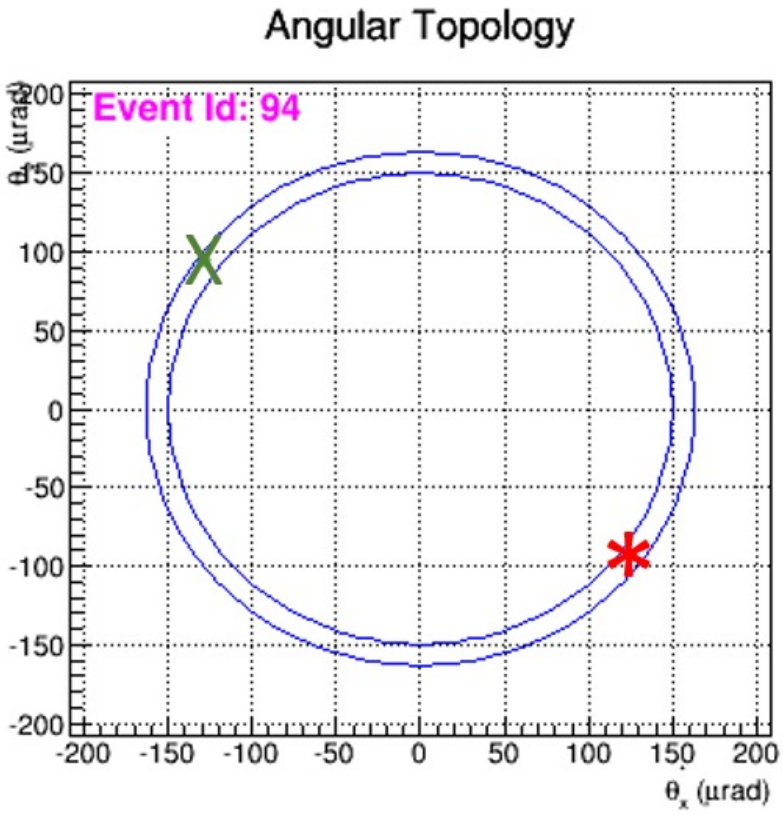

Angular Topology
Event Id: 81
θy (μrad)
θx (μrad)
200
150
100
50
0
-50
-100
-150
-200

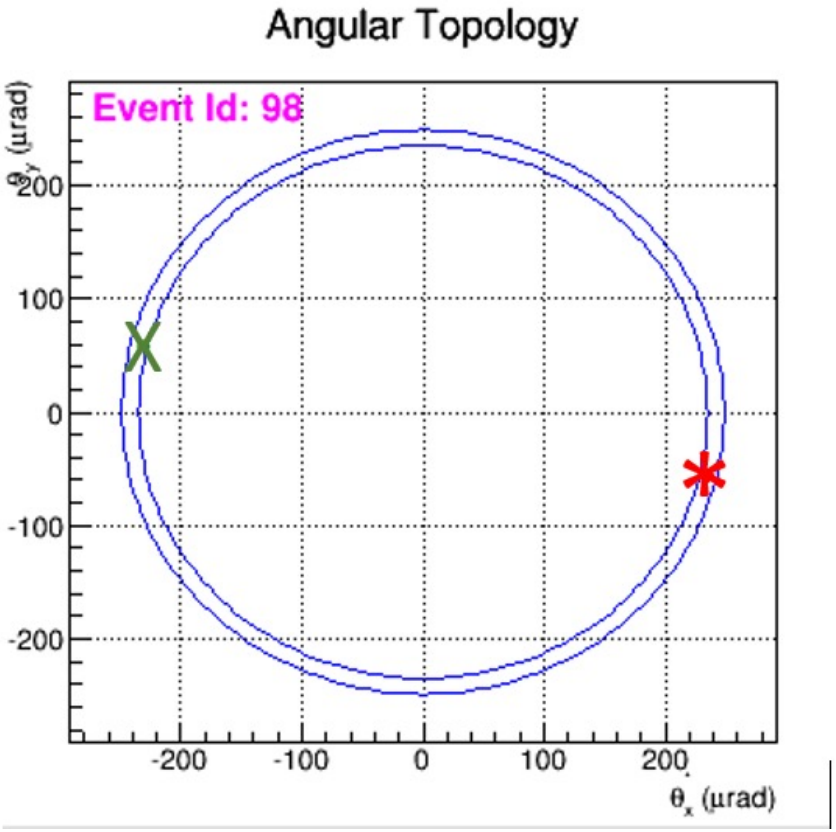

Angular Topology
Event Id: 84
θy (μrad)
θx (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200 -150 -100 -50 0 50 100 150 200

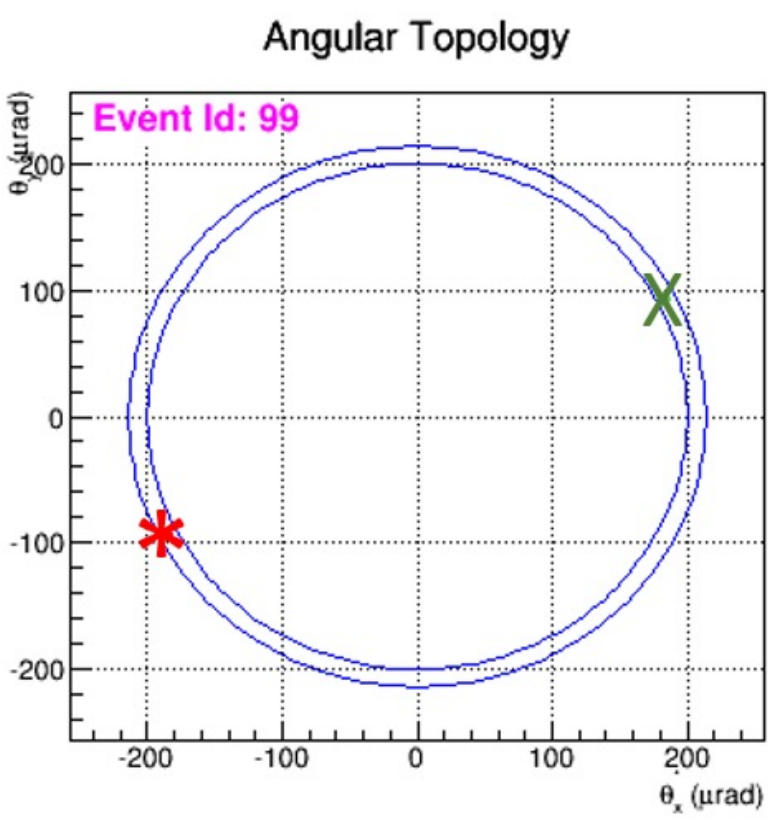

Angular Topology
Event Id: 85
θy (μrad)
θx (μrad)
200
100
0
-100
-200
-200 -100 0 100 200

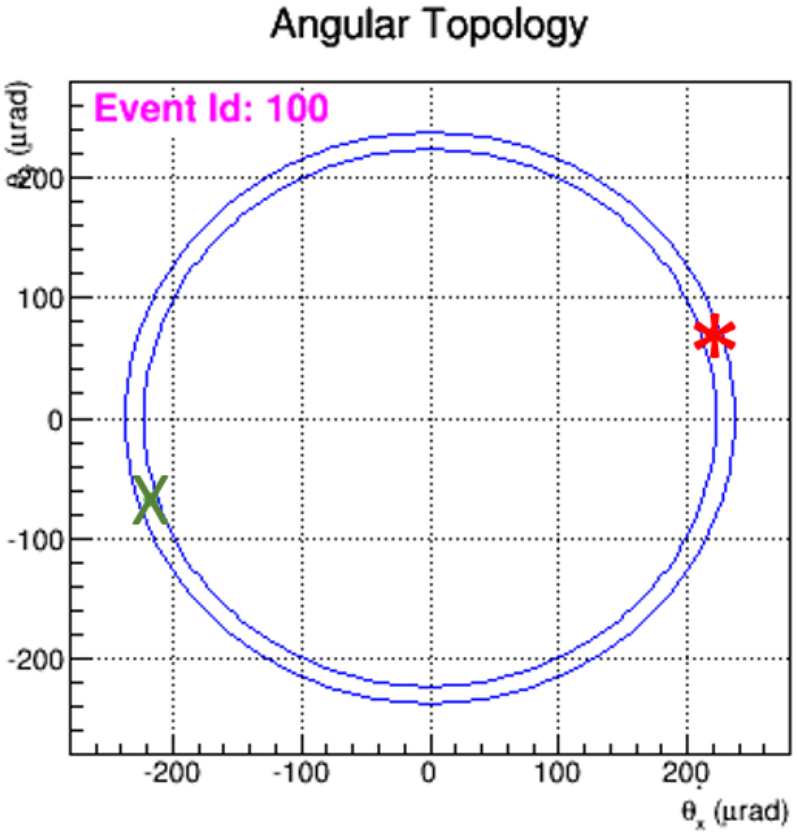

Angular Topology
Event Id: 89
θy (μrad)
θx (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200 -150 -100 -50 0 50 100 150 200

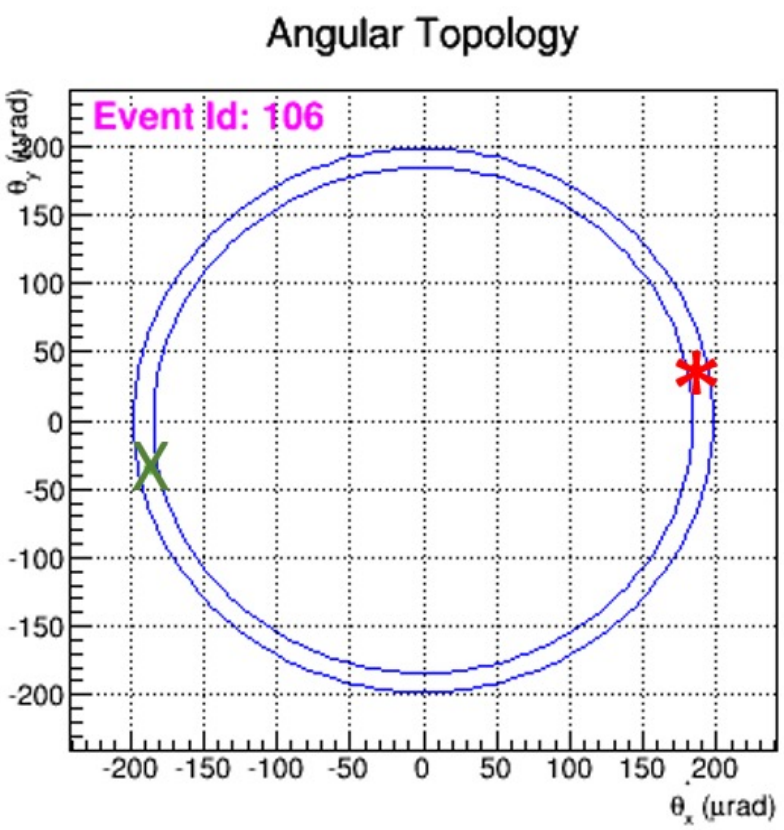

Angular Topology
Event Id: 92
θy (μrad)
θx (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200 -150 -100 -50 0 50 100 150 200

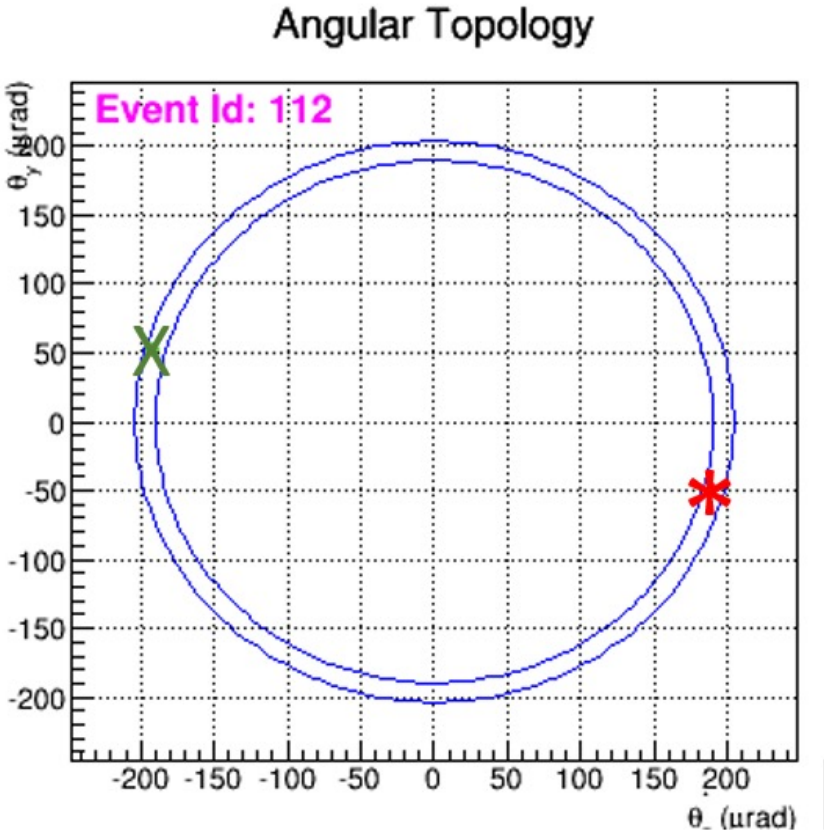

Angular Topology
Event Id: 94
θy (µrad)
θx (µrad)
200
150
100
50
0
-50
-100
-150
-200
-200 -150 -100 -50 0 50 100 150 200

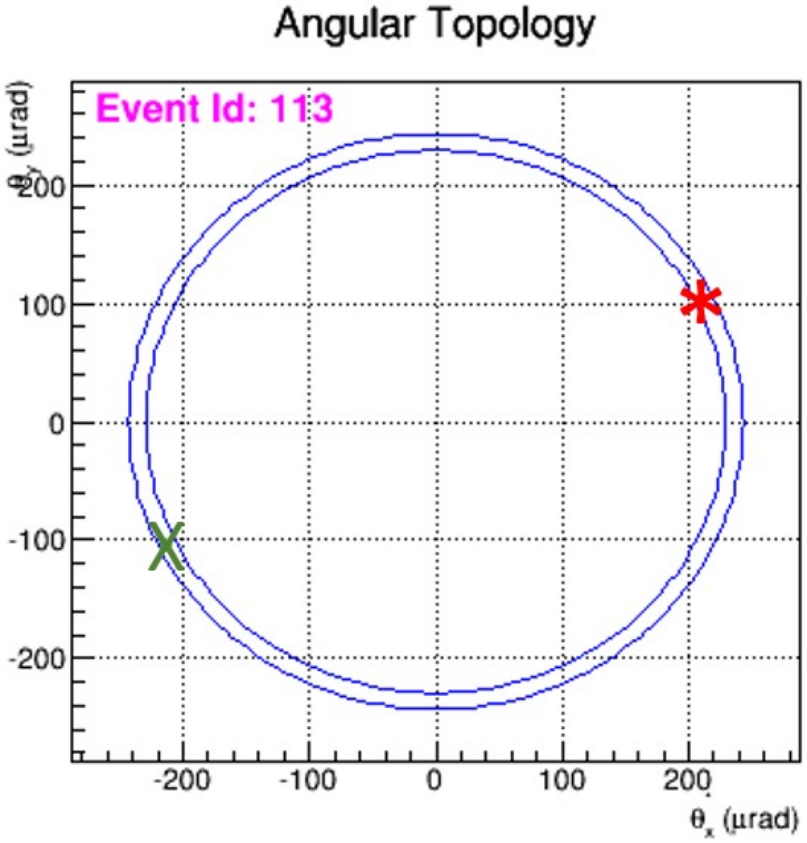

Angular Topology
Event Id: 98
θy (µrad)
θx (µrad)
200
100
0
-100
-200
-200 -100 0 100 200

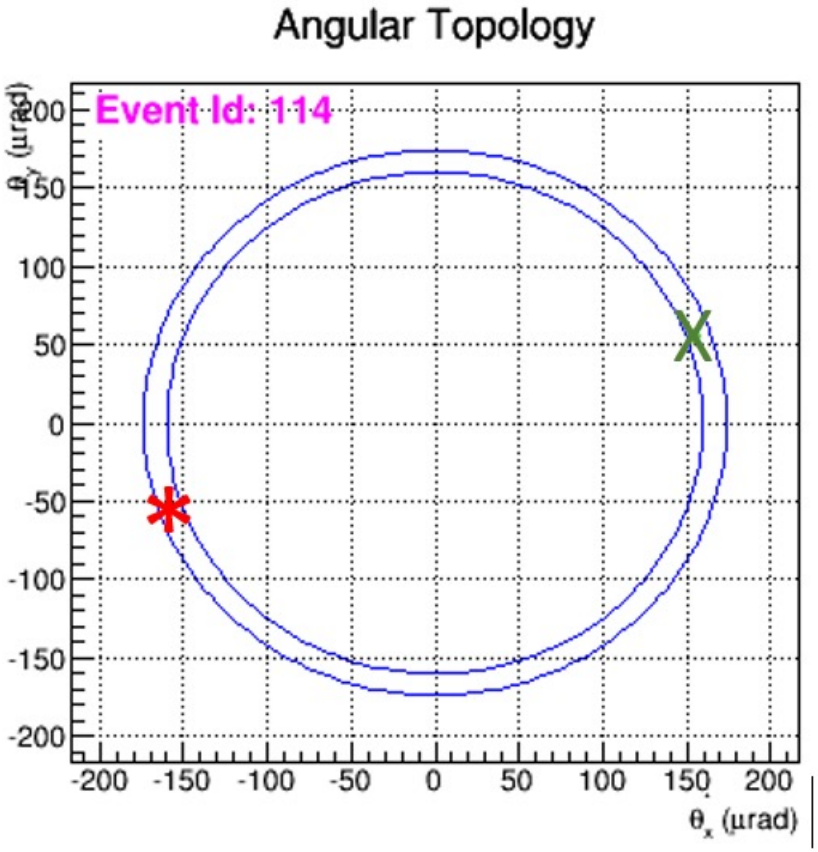

Angular Topology
Event Id: 99
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)
θy (μrad)


Angular Topology
Event Id: 100
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)
θy (μrad)


Angular Topology
Event Id: 106
θy (μrad)
θx (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200 -150 -100 -50 0 50 100 150 200


Angular Topology
Event Id: 112
θy (μrad)
θx (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200 -150 -100 -50 0 50 100 150 200


Angular Topology
Event Id: 113
θy (μrad)
200
100
0
-100
-200
-200
-100
0
100
200
θx (μrad)


Angular Topology
Event Id: 114
θy (μrad)
200
150
100
50
0
-50
-100
-150
-200
-200
-150
-100
-50
0
50
100
150
200
θx (μrad)