Flux corrections

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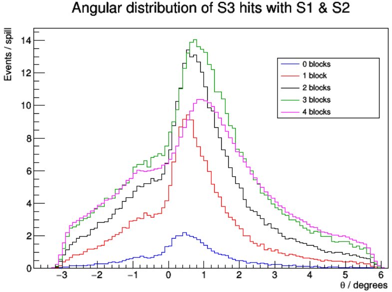
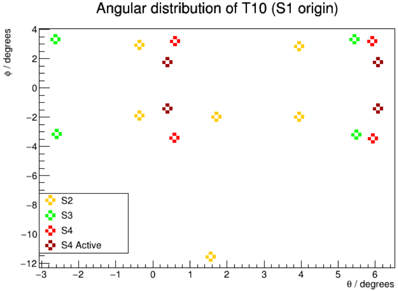
The problem





- Was correcting flux between *Sn* just using ratio of the solid angles covered
- However, this assumes constant flux through all components
- We know flux varies greatly in angle covered by detectors (see above) and with number of moderator blocks
- Top left: Total $S1 \cap S2 \cap S3$ particle flux
- Top right: Angular positions of T10 components as seen from $S2$

Solution

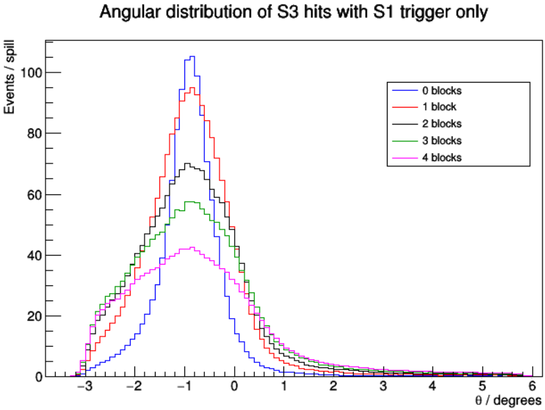
- For example: comparing $S1 \cap S2$ and $S1 \cap S2 \cap S4$
  1. Take 2D distribution of $S1 \cap S2 \cap S3$ flux in terms of off axis angles (θ, ϕ) – this covers the largest angular part of the beamline (see previous slide)
  2. Integrate this distribution over angle covered by $S2$ and normalize area to 1
  3. Integrate normalized distribution over angular range covered by $S4$
  4. Divide measured $S1 \cap S2 \cap S4$ flux by this factor

$S1 \cap S2 \cap S4$ correction results

# block	$S1 \cap S2$	$S1 \cap S2 \cap S4$ meas.	Corr.	$S1 \cap S2 \cap S4$ corr.
0	683	208	0.6237	333
1	1913	665	0.6504	1022
2	2949	990	0.6675	1483
3	3415	1010	0.6785	1488
4	5630	1460	0.6657	2193

- All numbers given per spill
- This process can be repeated to give the geometric correction factor between $S1 \cap S2 \cap S4$ and $S1 \cap S2 \cap S3$

Further flux factor calculations



- Repeated previous method but used $S1 \cap S3$ flux and normalised area of this to 1.
- Flux is shown above

Flux factors

# blocks	$S3$ int.	$S2$ int.	$S2 \cap S4$ int.	$S4$ int.
0	1	0.1596	0.02074	0.02287
1	1	0.2480	0.04051	0.04362
2	1	0.2741	0.05943	0.06385
3	1	0.2893	0.07760	0.08423
4	1	0.3025	0.09816	0.1079