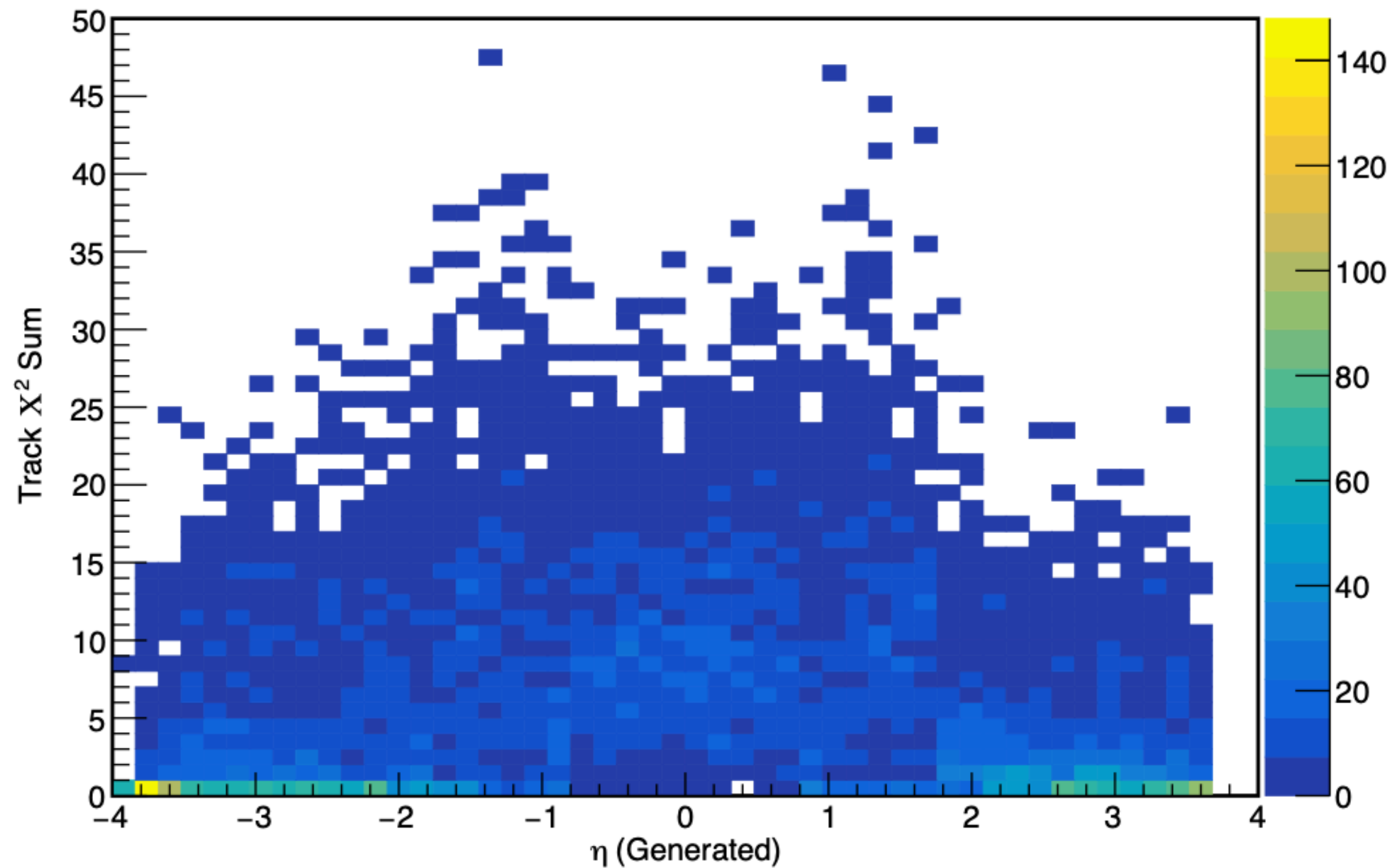


3/7/2023 Update

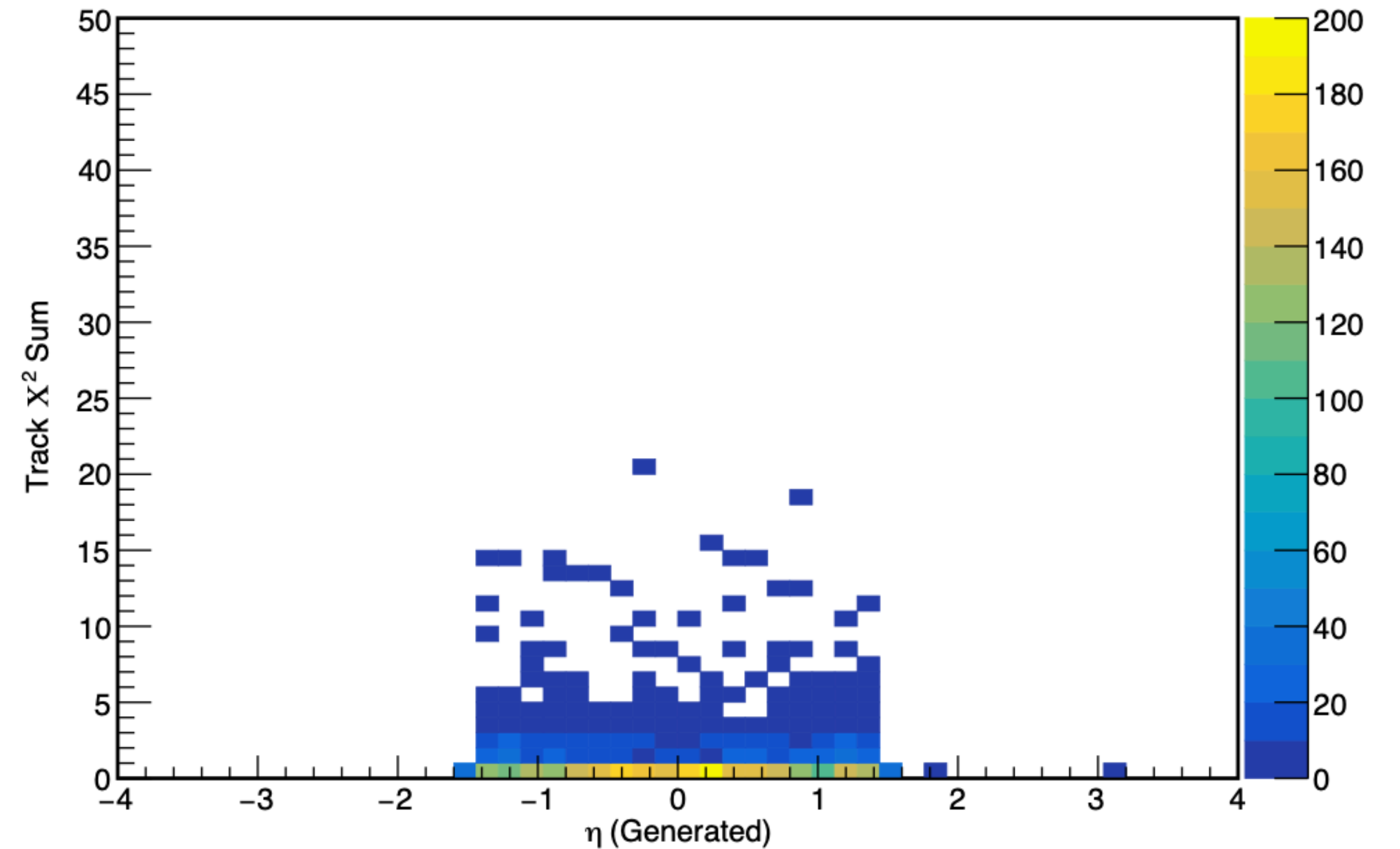
Recap, last week:

Track χ^2 Sum vs η

Energy threshold = 0 keV



Energy threshold = 0.396 keV



Code Error

Incorrect:

```
double edep = sim_hit->getEDep();
if (edep * units::keV < m_cfg.threshold) {
    m_log->debug(" edep is below threshold of {:.2f} [keV]", m_cfg.threshold / units::keV);
    continue;
}
```

- $\text{units::keV} = 10^{-6}$

$$[\text{GeV}] * \frac{10^6 [\text{keV}]}{[\text{GeV}]} = [\text{keV}]$$

Code Fix

Correct:

```
double edep = sim_hit->getEDep();
if (edep / units::keV < m_cfg.threshold) {
    m_log->debug(" edep is below threshold of {:.2f} [keV]", m_cfg.threshold / units::keV);
    continue;
}
```

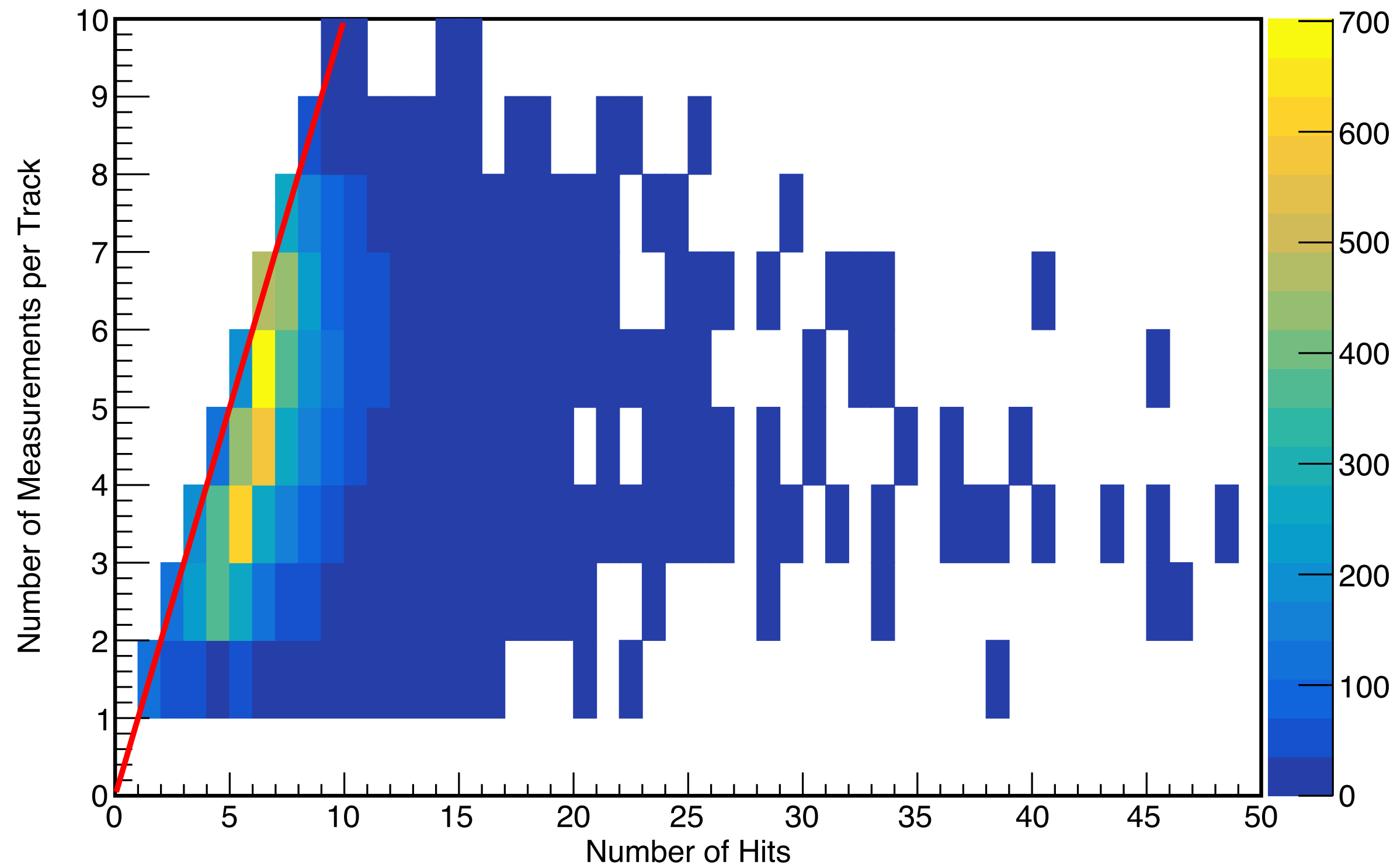
- $\text{units::keV} = 10^{-6}$

$$[\text{GeV}] * \frac{10^6 [\text{keV}]}{[\text{GeV}]} = [\text{keV}]$$

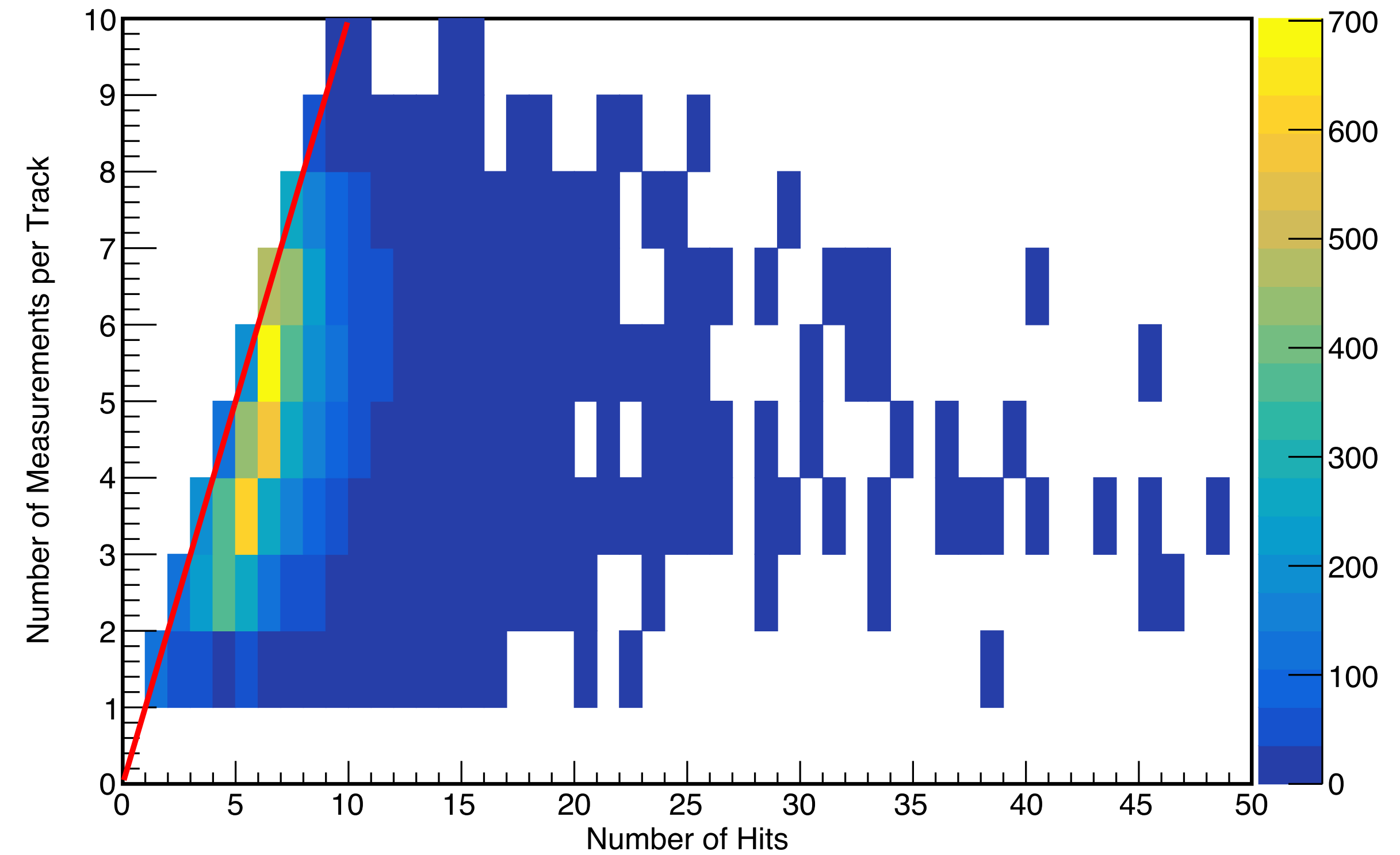
- Detectors that use default threshold: Si barrel tracker, Si barrel vertex, Si endcap tracker
- Detectors that do not: BTOF, ECTOF, barrel MPGD

threshold = 0.396 keV

Energy threshold = 0 keV

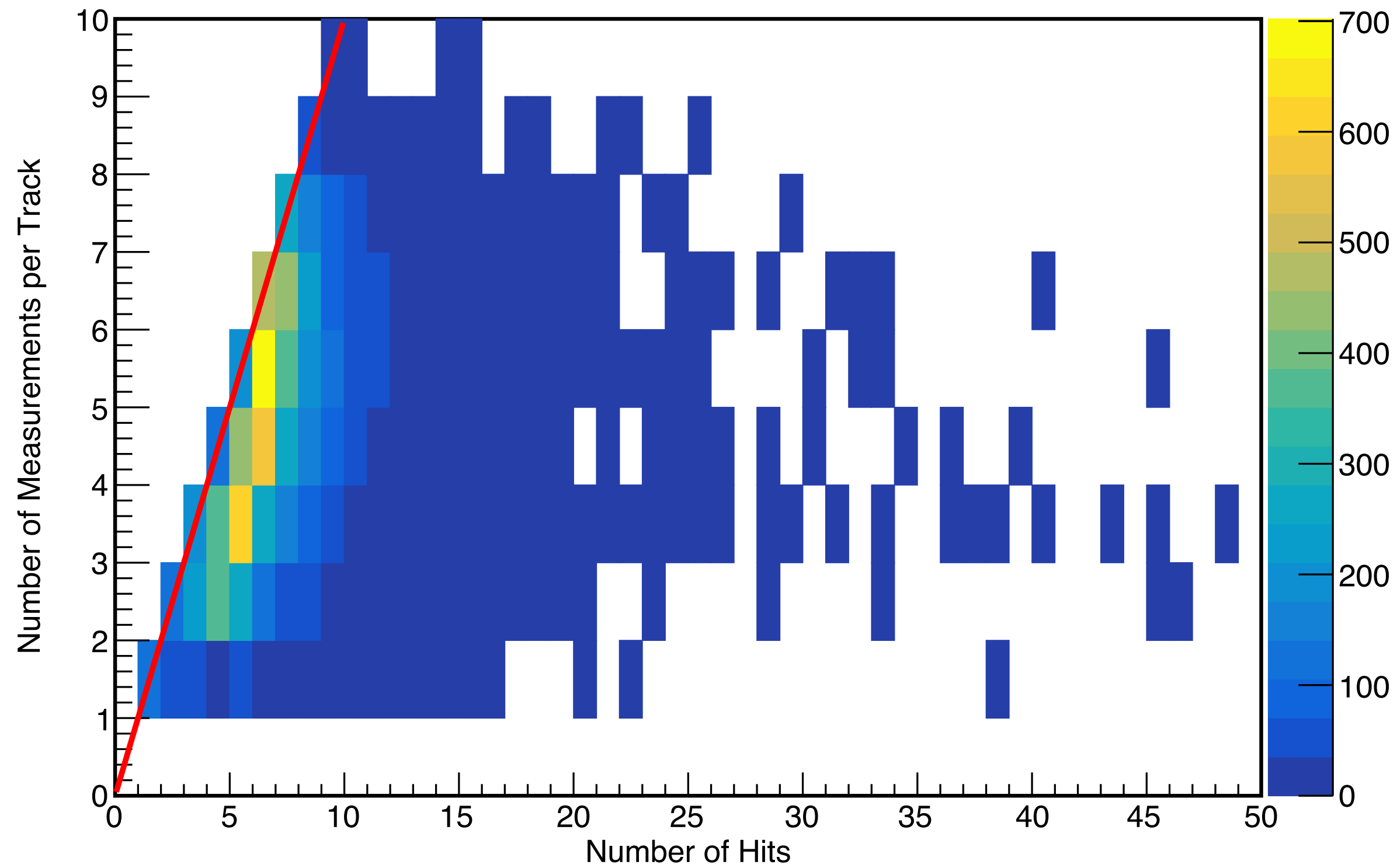


Energy threshold = 0.396 keV

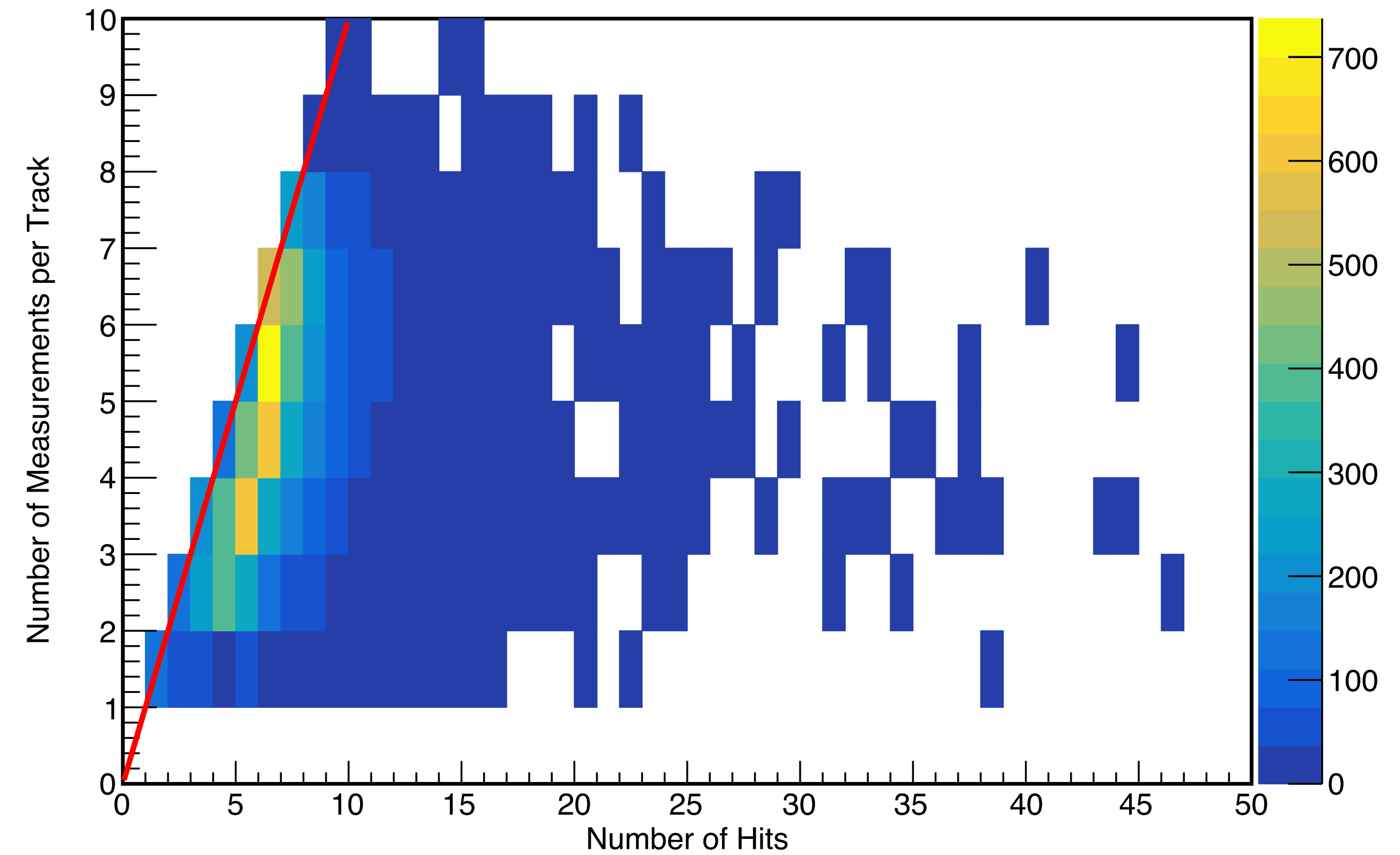


threshold = 1.2 keV

Energy threshold = 0 keV

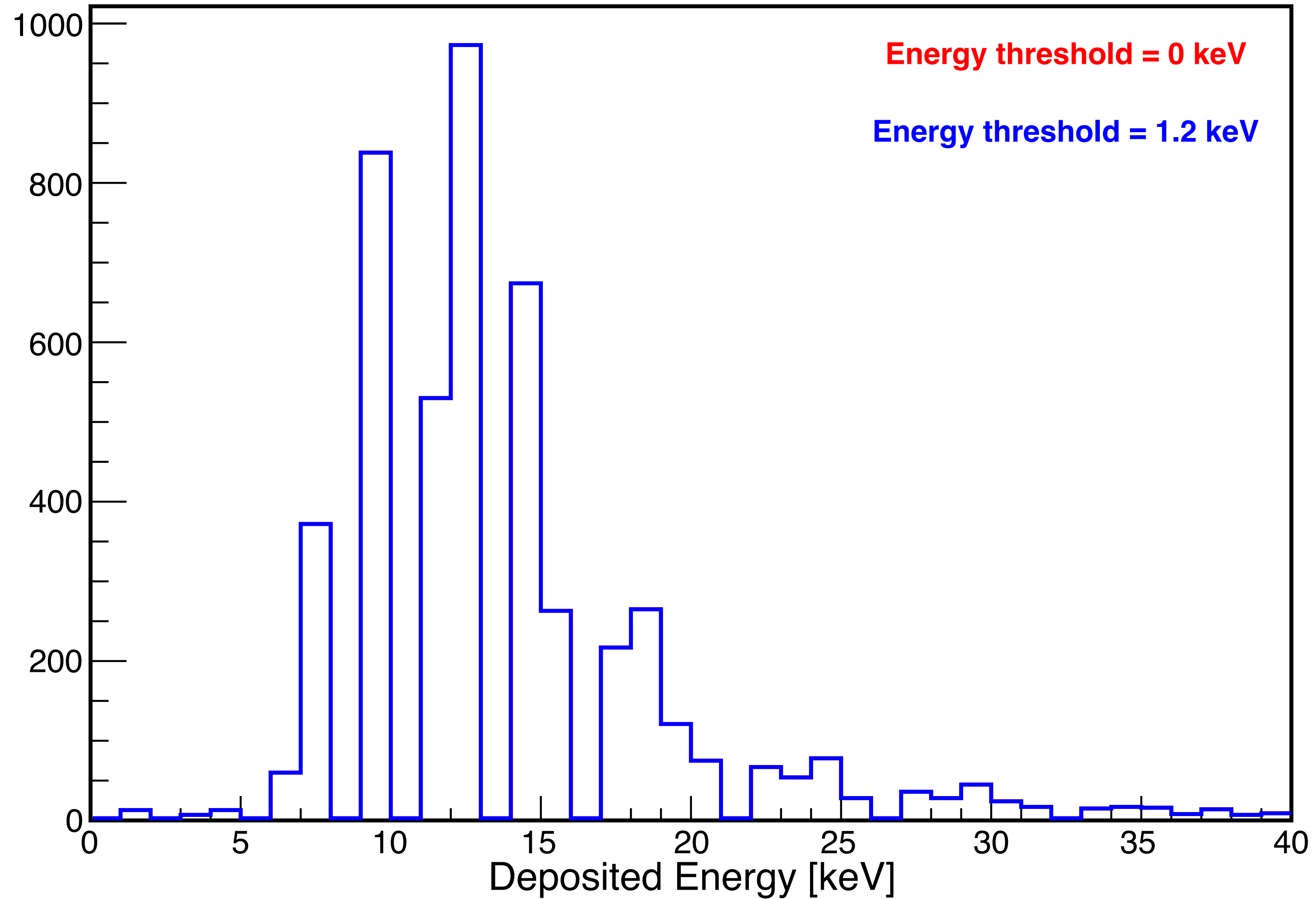


Energy threshold = 1.2 keV



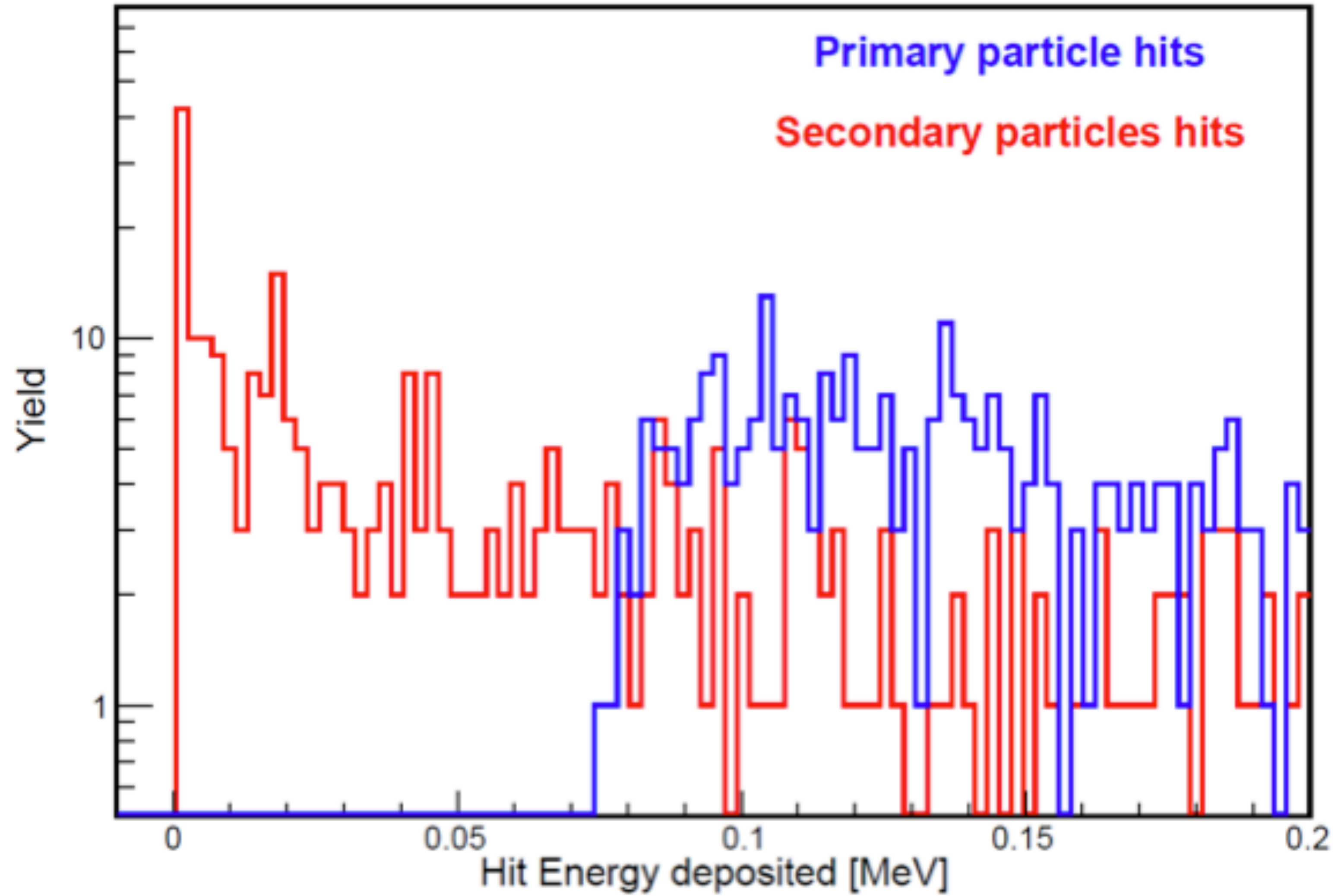
Si Tracker Barrel Hits

SiBarrelTrackerRechits.edep



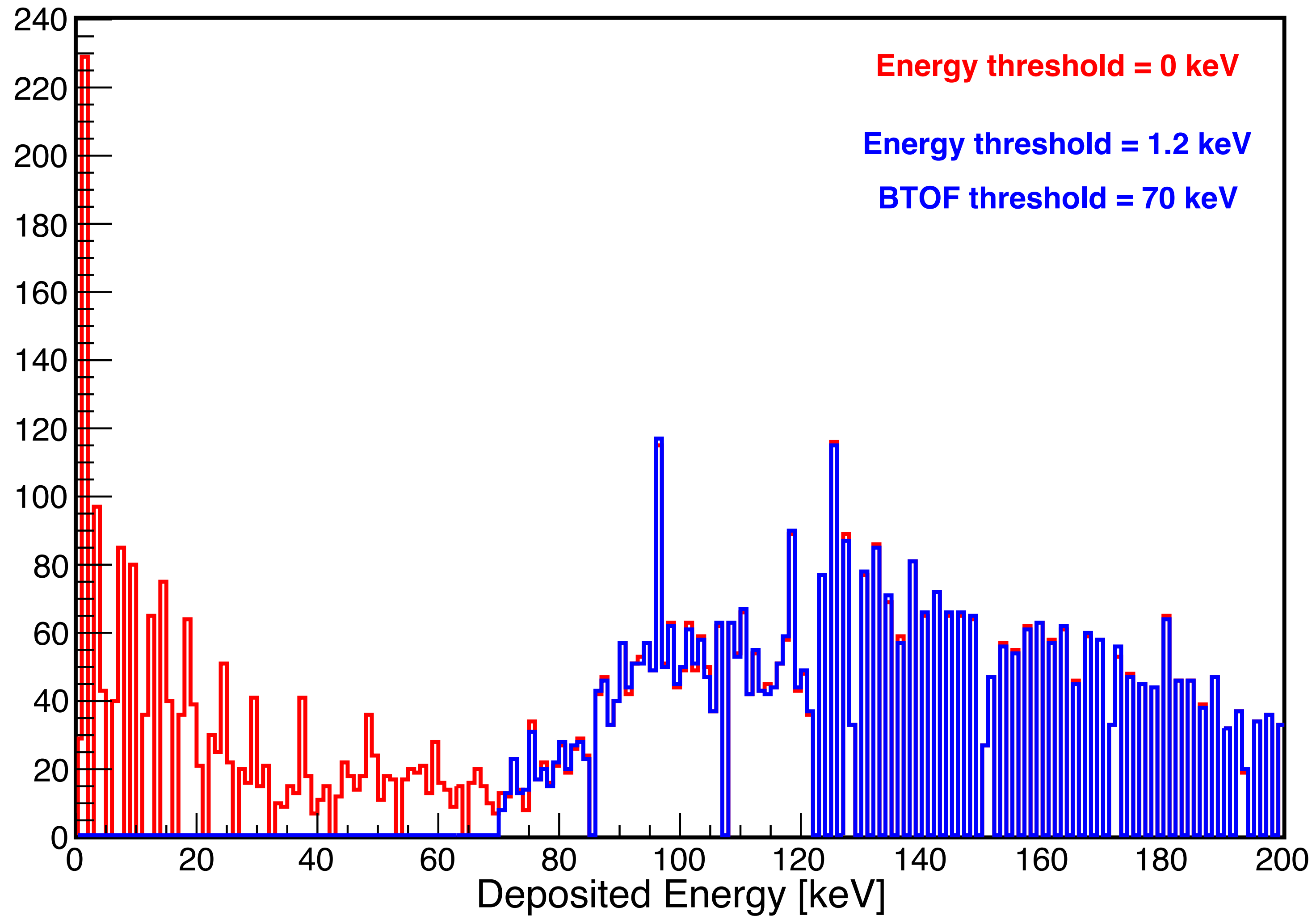
Hit energy deposition

Barrel TOF



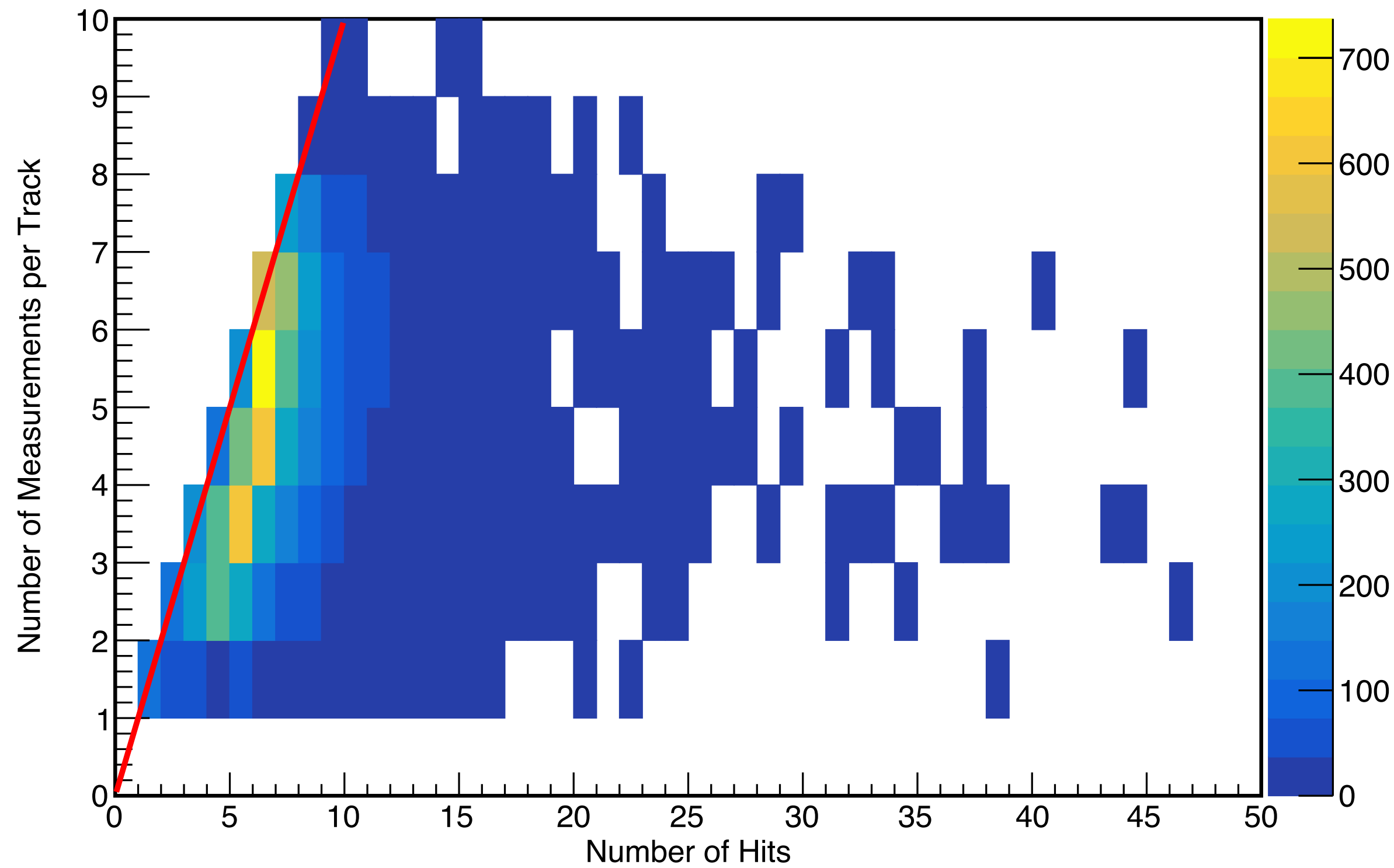
TOF Barrel Hits

TOFBarrelRechHit.edep

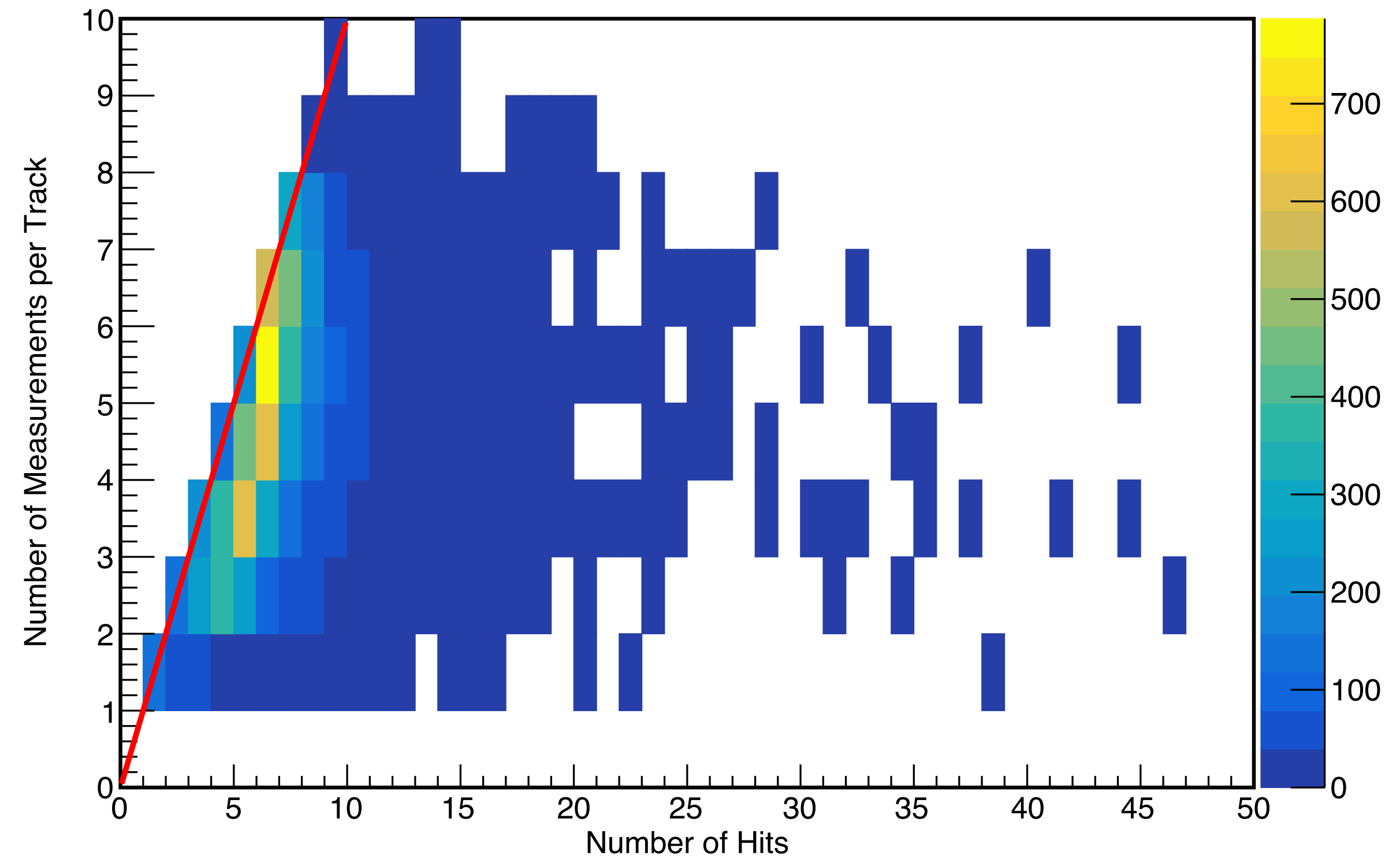


BTOF threshold = 70 keV

Energy threshold = 1.2 keV



Energy threshold = 1.2 keV, BTOF threshold = 70 keV



Summary

- Do not see much difference when energy threshold = 1.2 keV is applied
- Tested a higher threshold in the BTOF as a check
- A git issue has been created, and I have been assigned to fix it