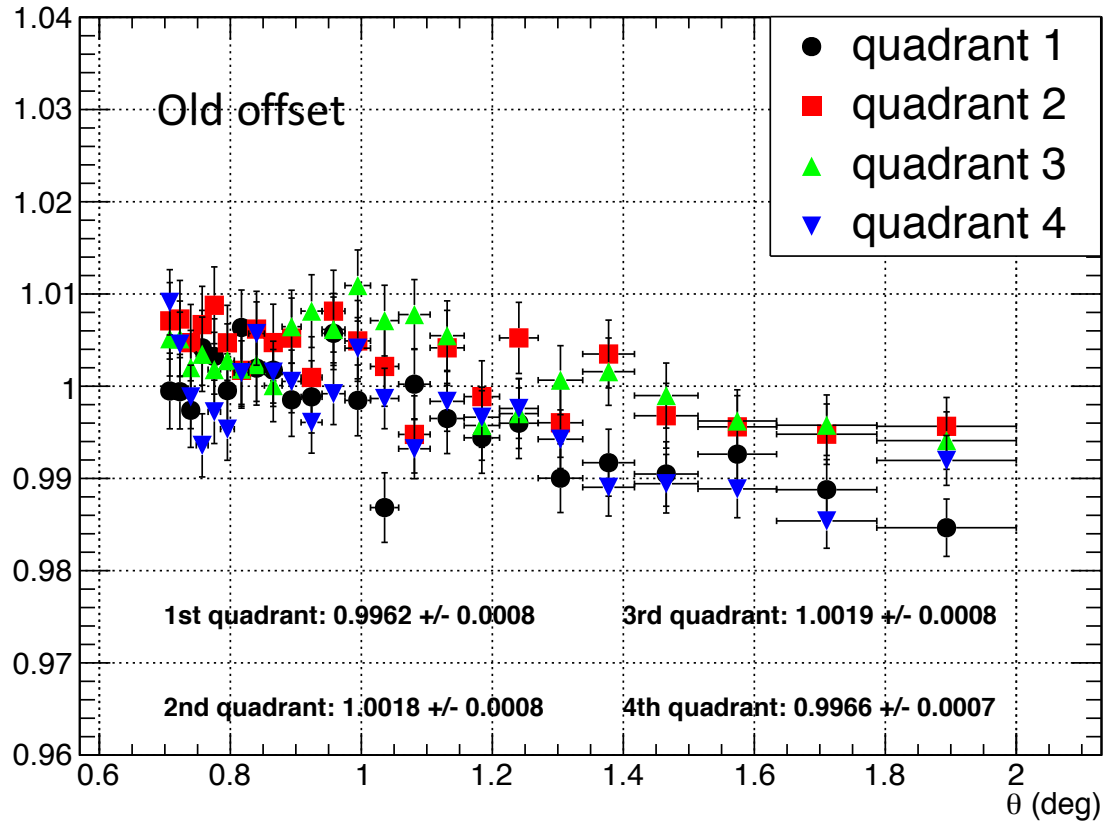
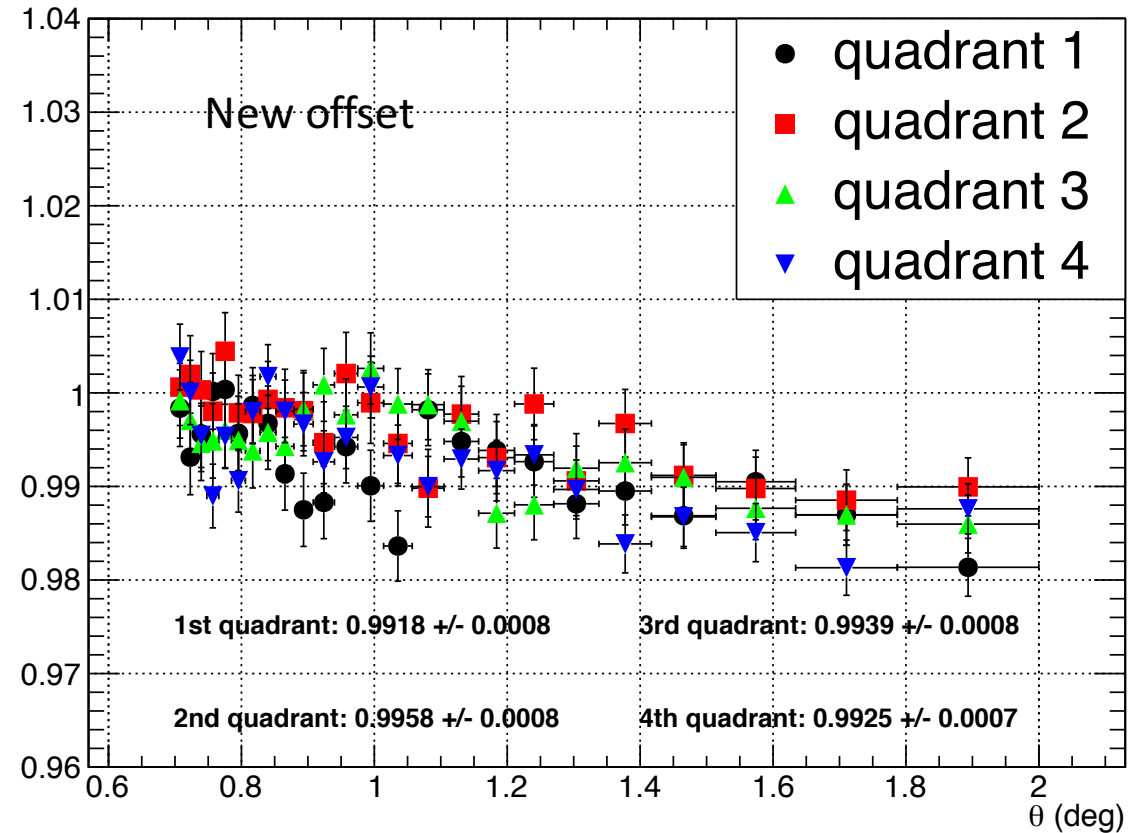


Offset effect on ep/ee ratio in different quadrants

Graph



Graph

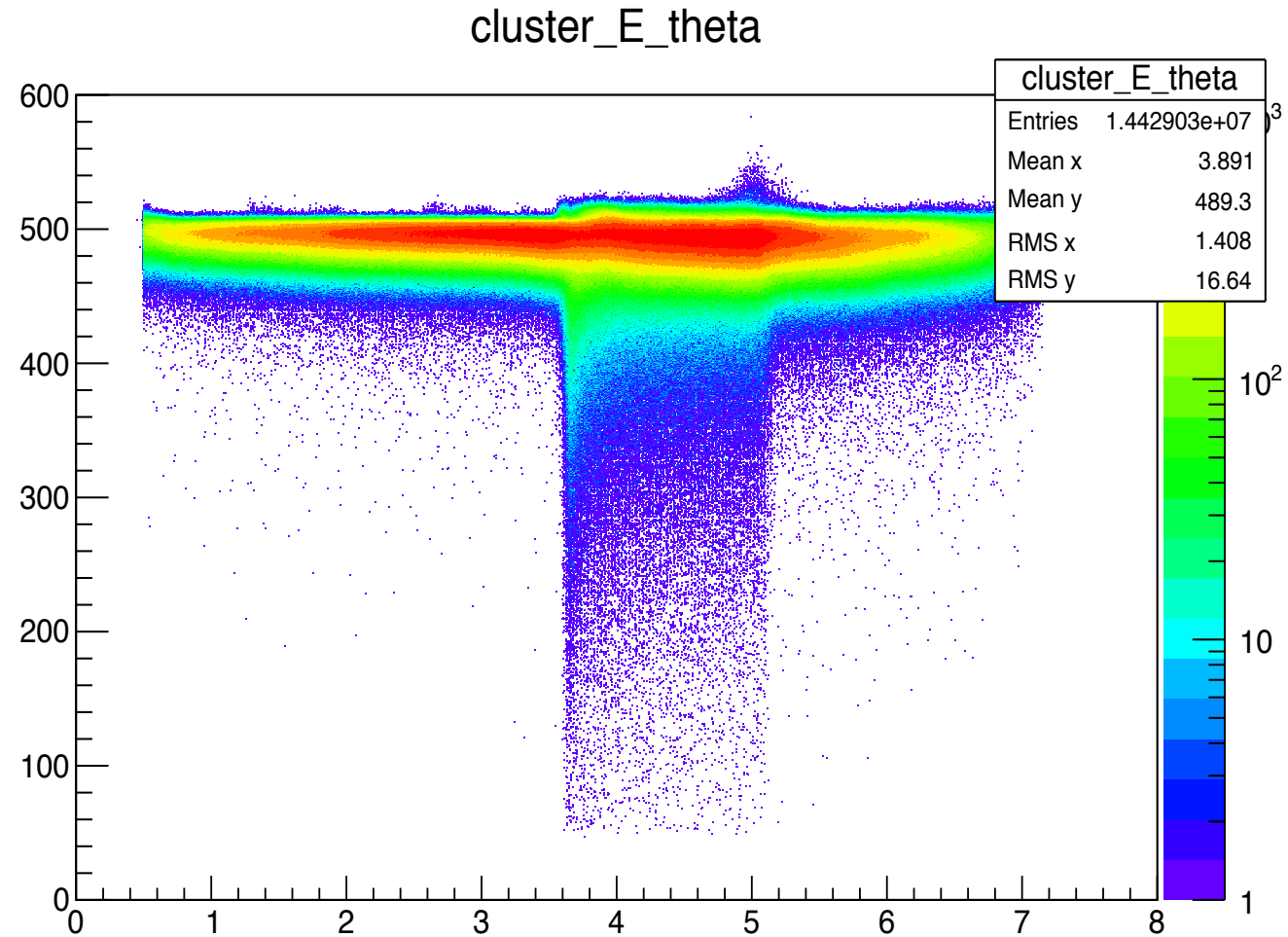


List of major problems

- Inelastic ep contamination
- Generator comparison for ep
- Simulation near transition region
- GEM efficiency
- HyCal trigger efficiency

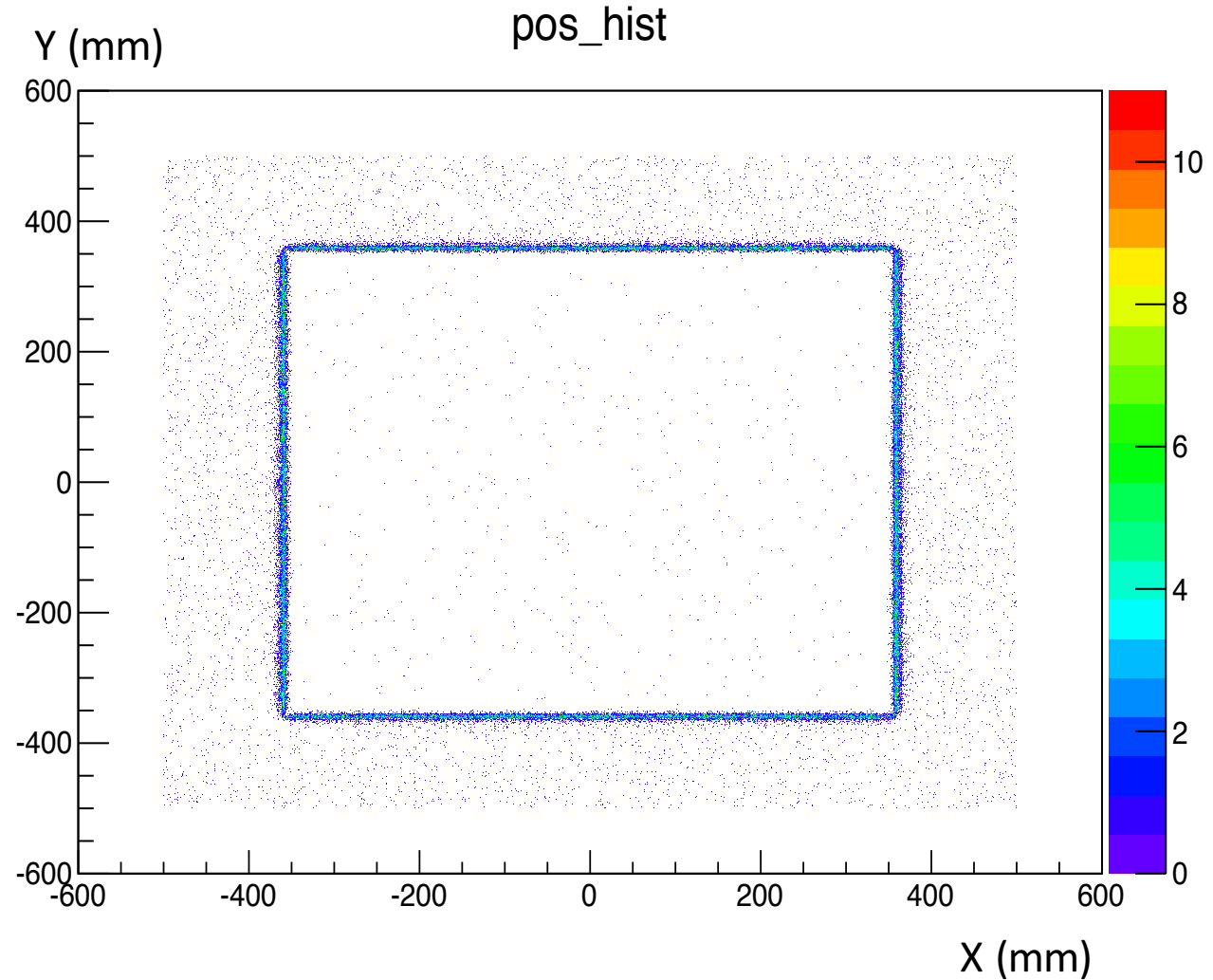
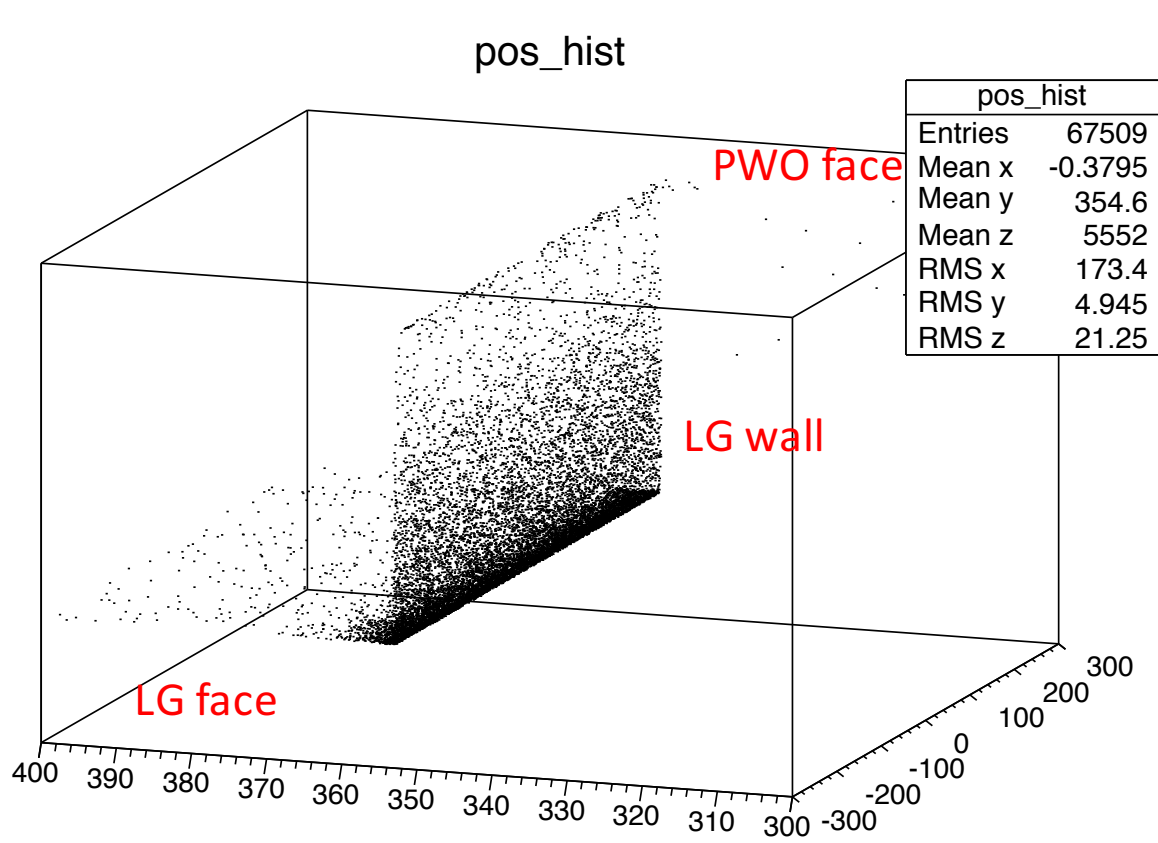
Simulation near transition region

- We saw in the simulation, clusters tend to lose more energy than the data
- To study this:
 - Generate uniform distribution in x and y on HyCal with constant energy electron
 - Remove all material before HyCal (except for the ArCO₂ gas layer of GEM)
 - No internal rad effect
 - No smearing with detector resolution

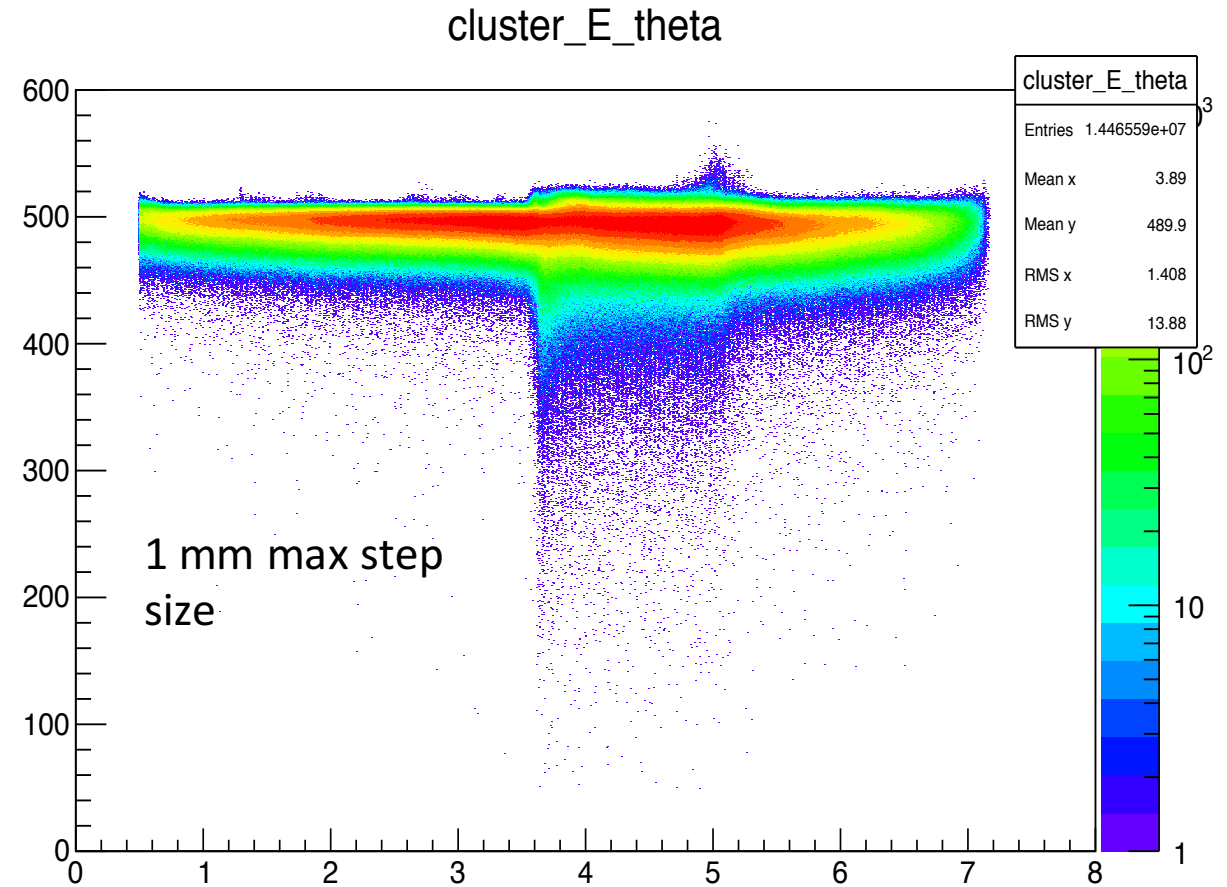
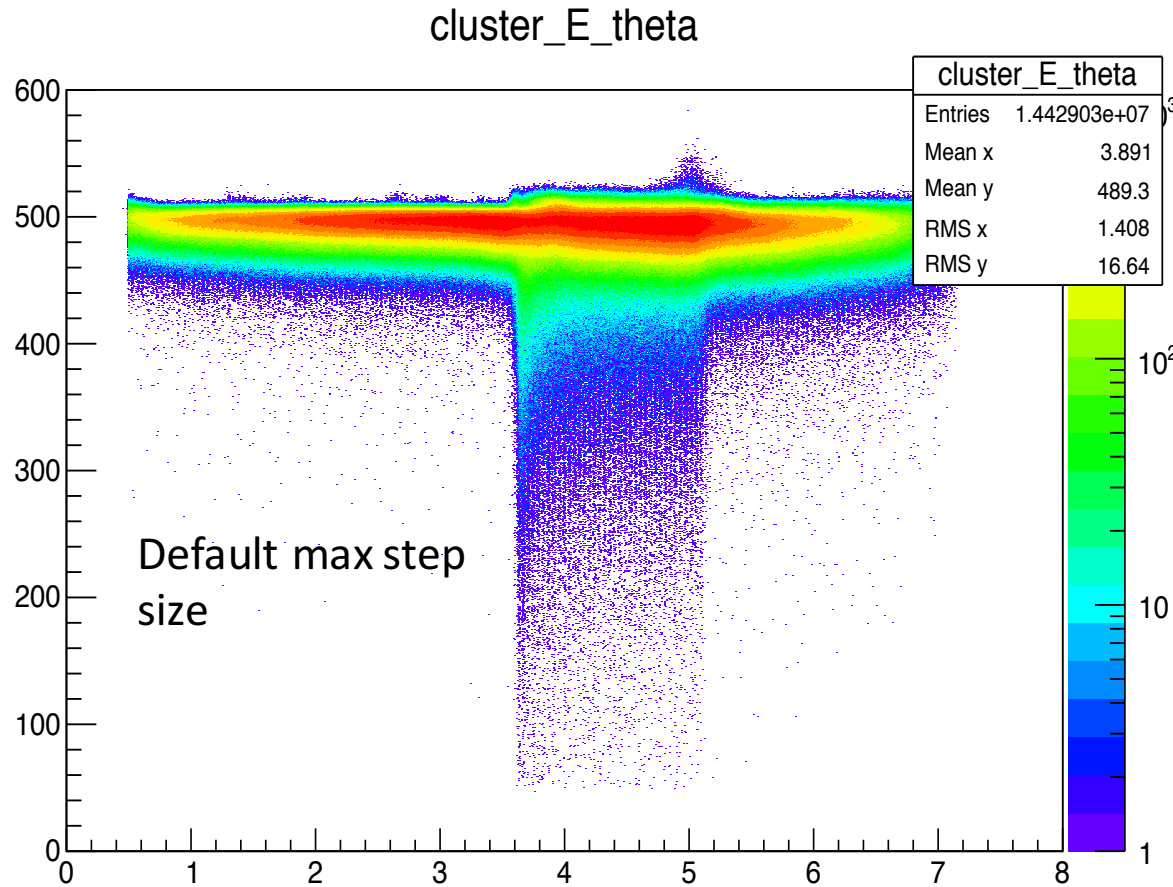


Simulation near transition region

Hit position distribution for events with **total energy deposition** less than $0.8 \times E_i$



Simulation near transition region



- Results don't change much anymore for max step size < 10mm and > 0.2 mm

Simulation near transition region

- If using default step size, total count with $E < 400$ MeV / total count with $E > 400$ MeV $\sim 2.4\%$
- If using default step, the ratio is $\sim 0.8\%$

