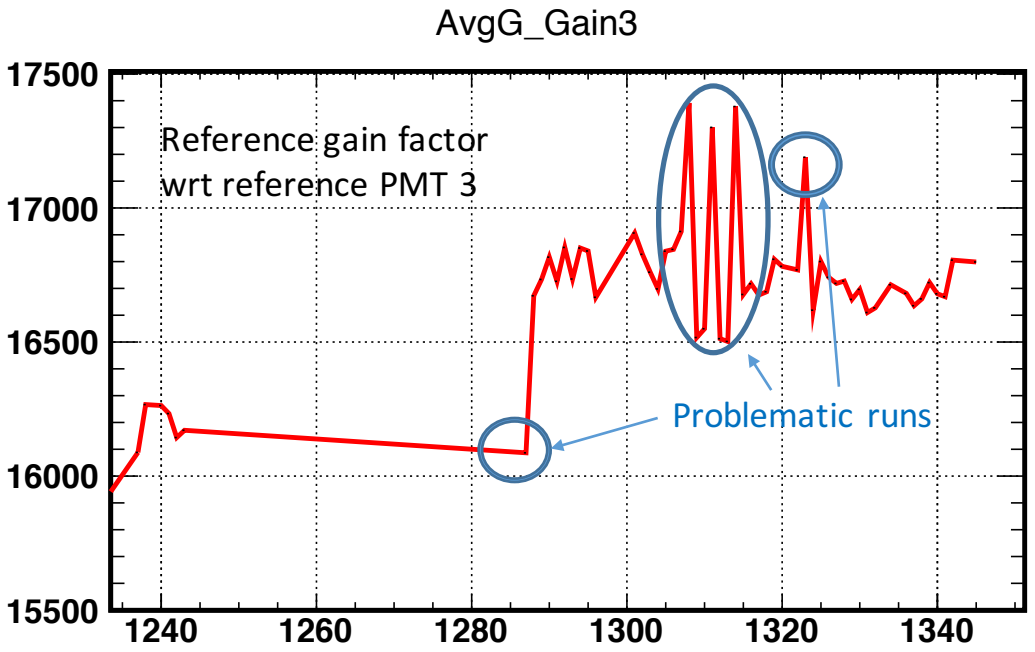
Lead Glass LMS issue continue

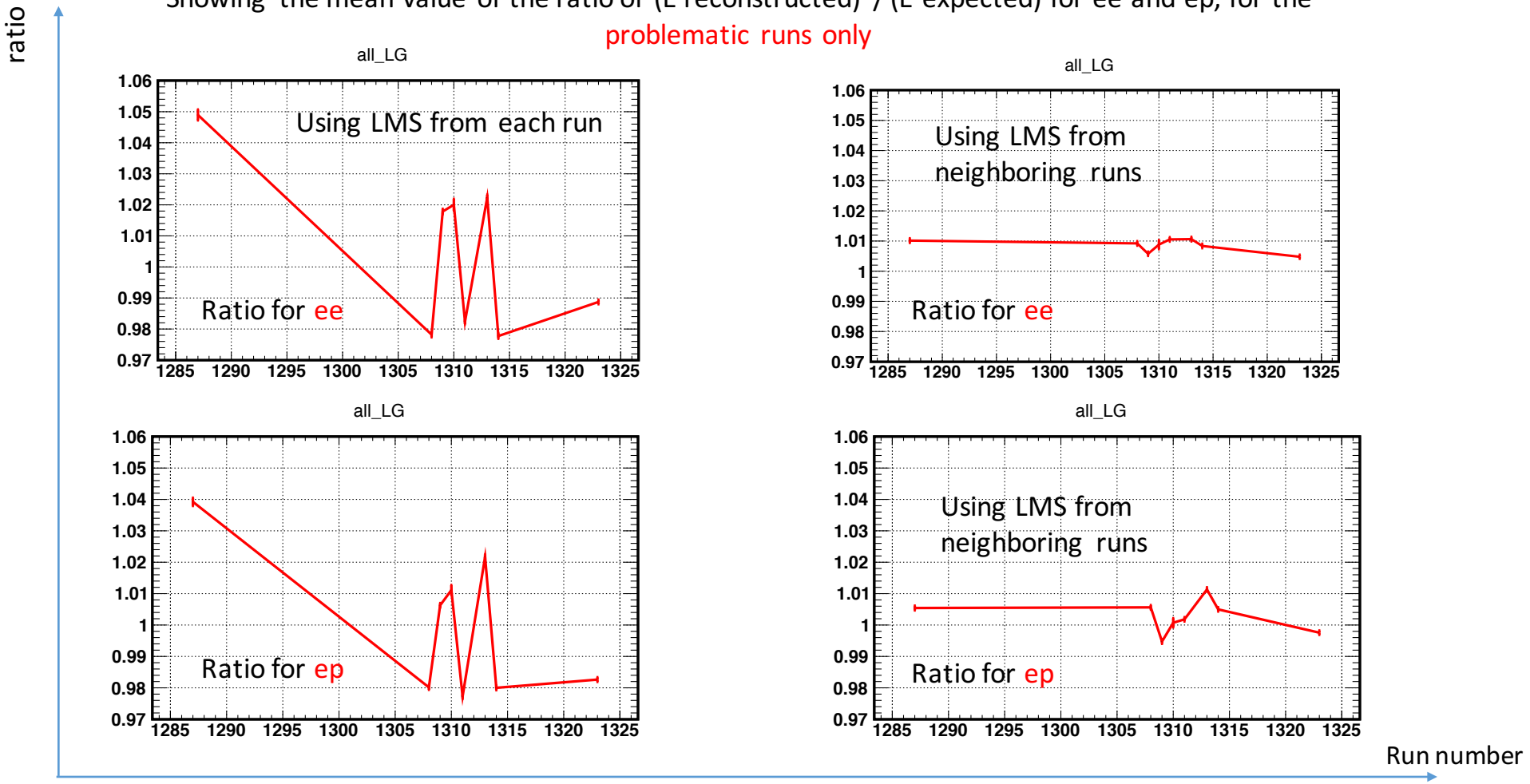
- For the calibration period 1238 ~ 1341 of the 1.1 GeV runs, the following runs are identified as those that have issue with the LMS measurement:
  - 1287, 1308~1314, 1323

- This problem is not observed in the PWO modules
- In this study, I try to apply the mean value of LMS measurement from the neighboring runs to the problematic run (using mean values from 1288 to 1336, excluding the problematic run)
- When using LMS from neighboring runs, only LG is applied, PWO always uses LMS from each run



Lead Glass LMS issue continue

Showing the mean value of the ratio of (E reconstructed) / (E expected) for ee and ep, for the problematic runs only

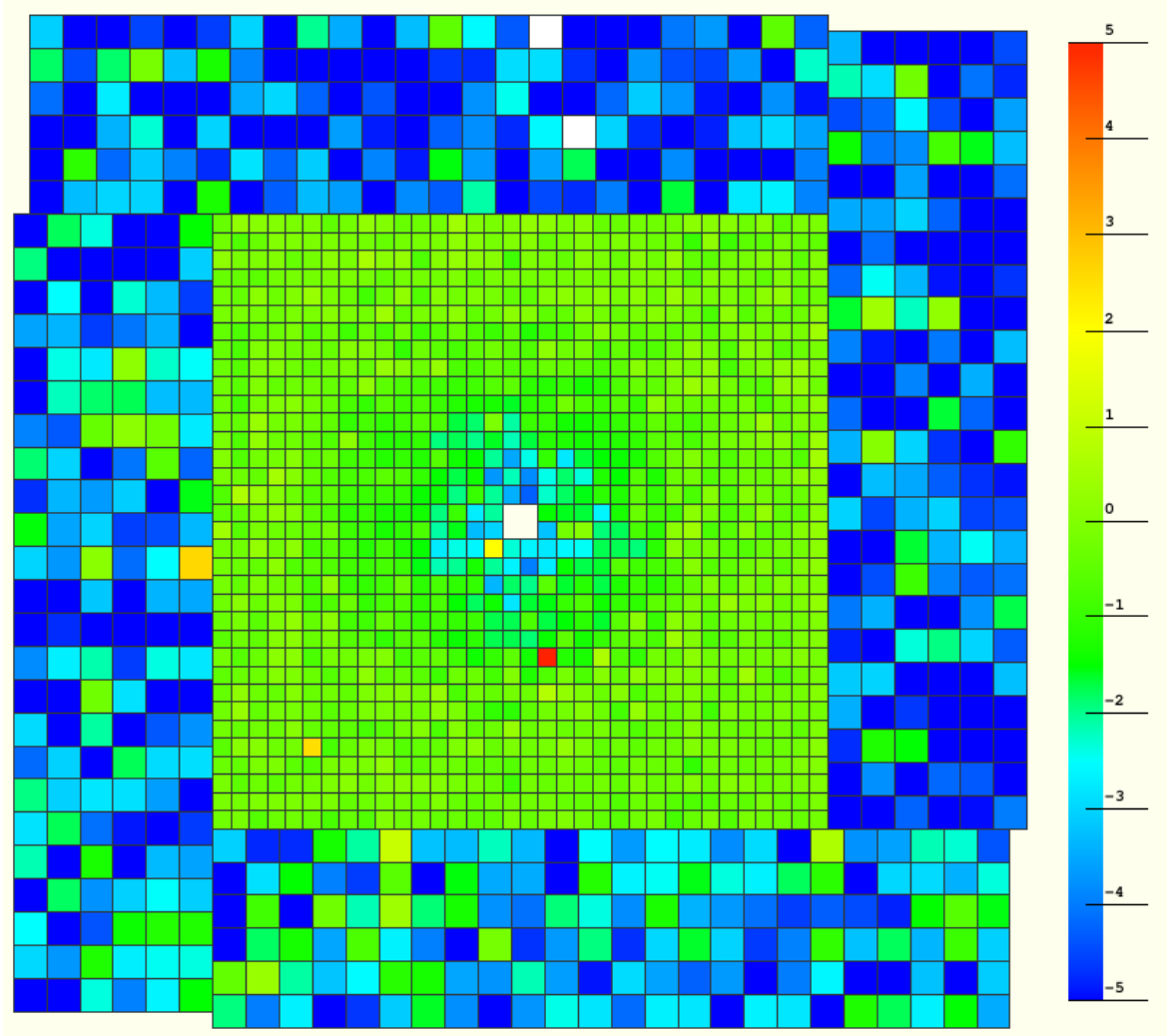


Lead Glass LMS issue continue

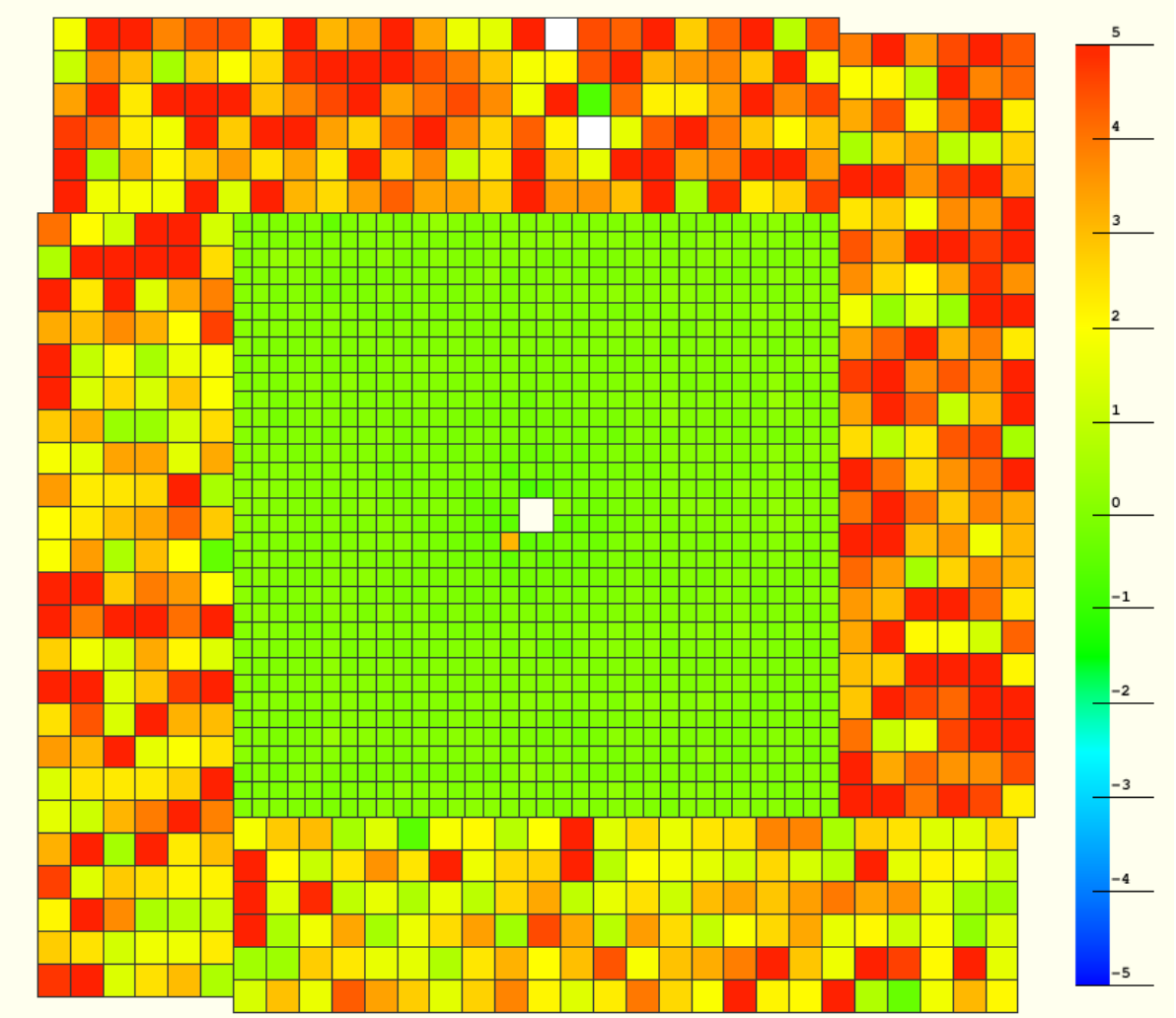
- In the following slides, I shown the deviation of pedestal subtracted LMS from the mean value of neighboring runs, for each of the problematic runs and each module
  - Mean values of the neighboring runs are averaged from all the runs between 1288 and 1336, excluding the problematic runs

- The z axis will be:
  - 100 x (pedestal subtracted LMS of each run – pedestal subtracted mean LMS from the neighboring runs) / (pedestal subtracted mean LMS from the neighboring runs)

Run 1287



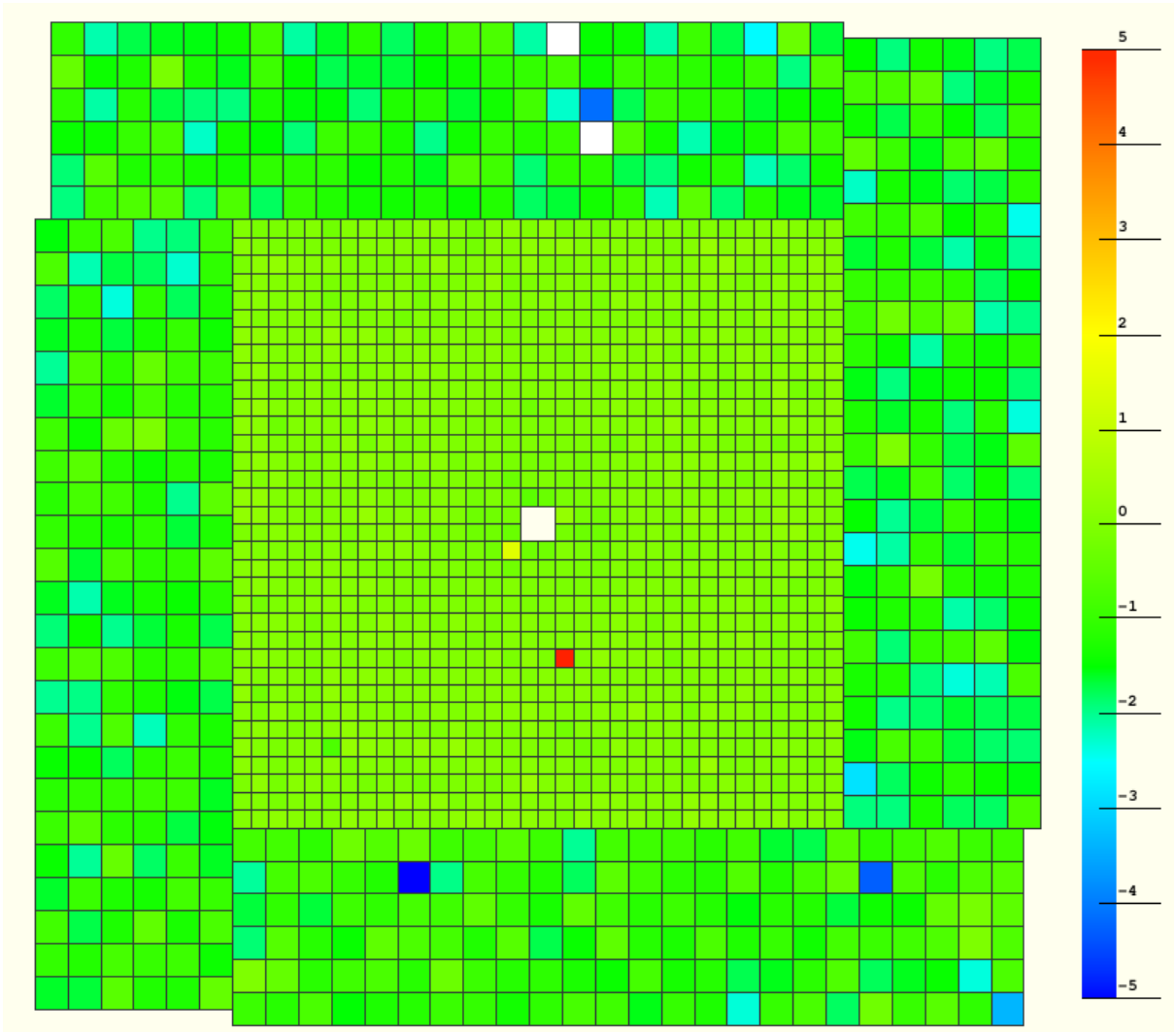
Run 1308



5%

-5%

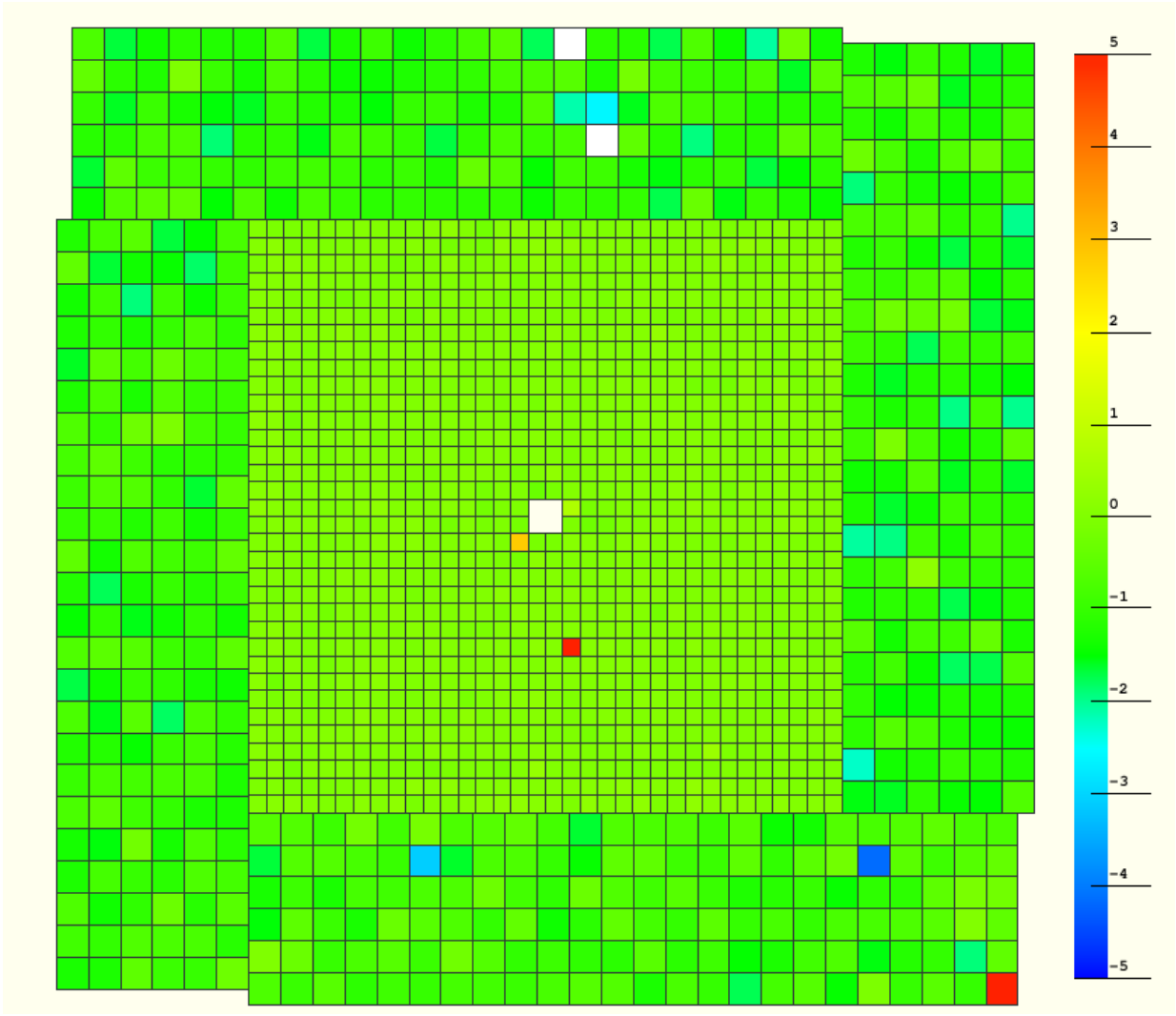
Run 1309



5%

-5%

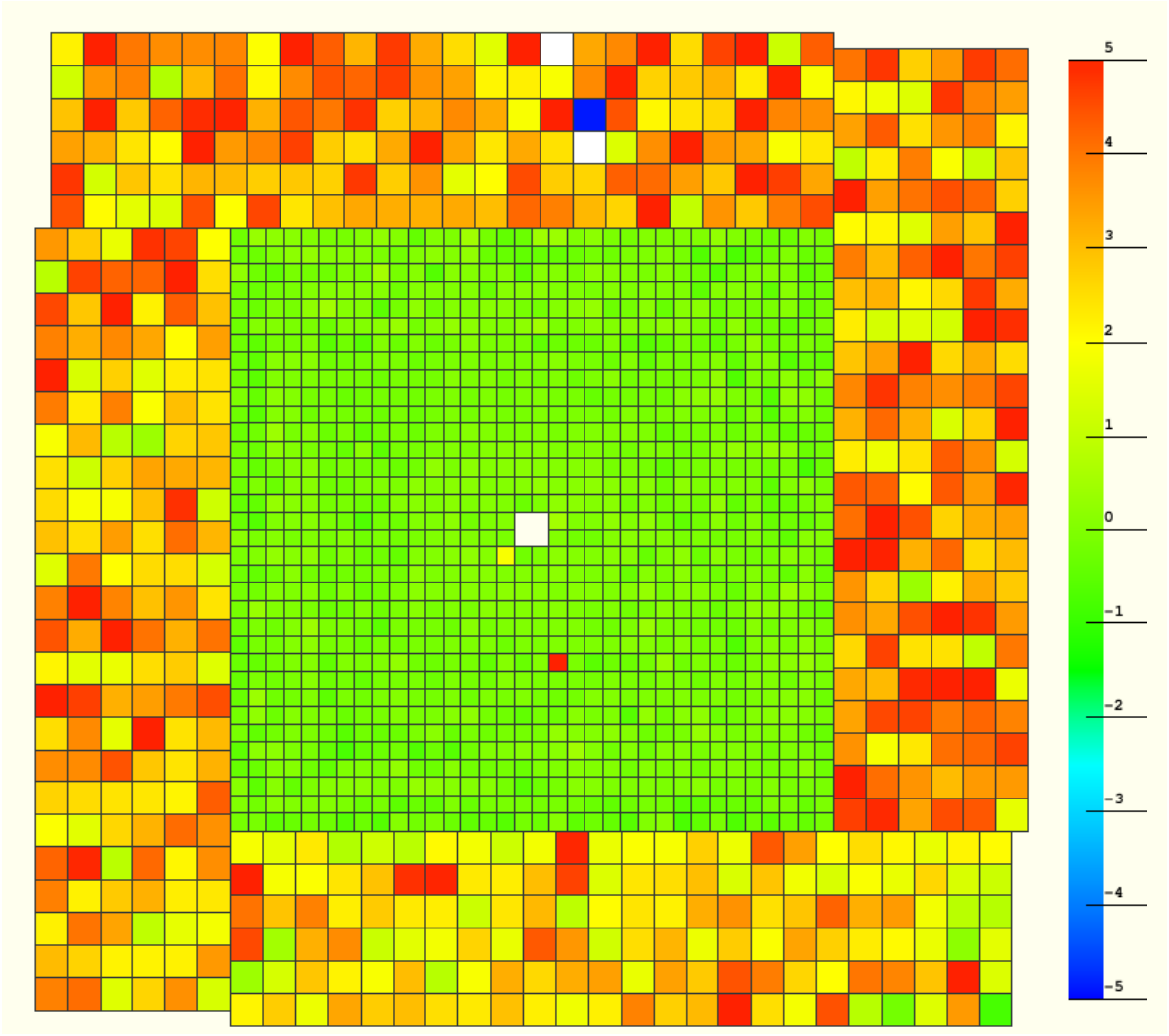
Run 1310



5%

-5%

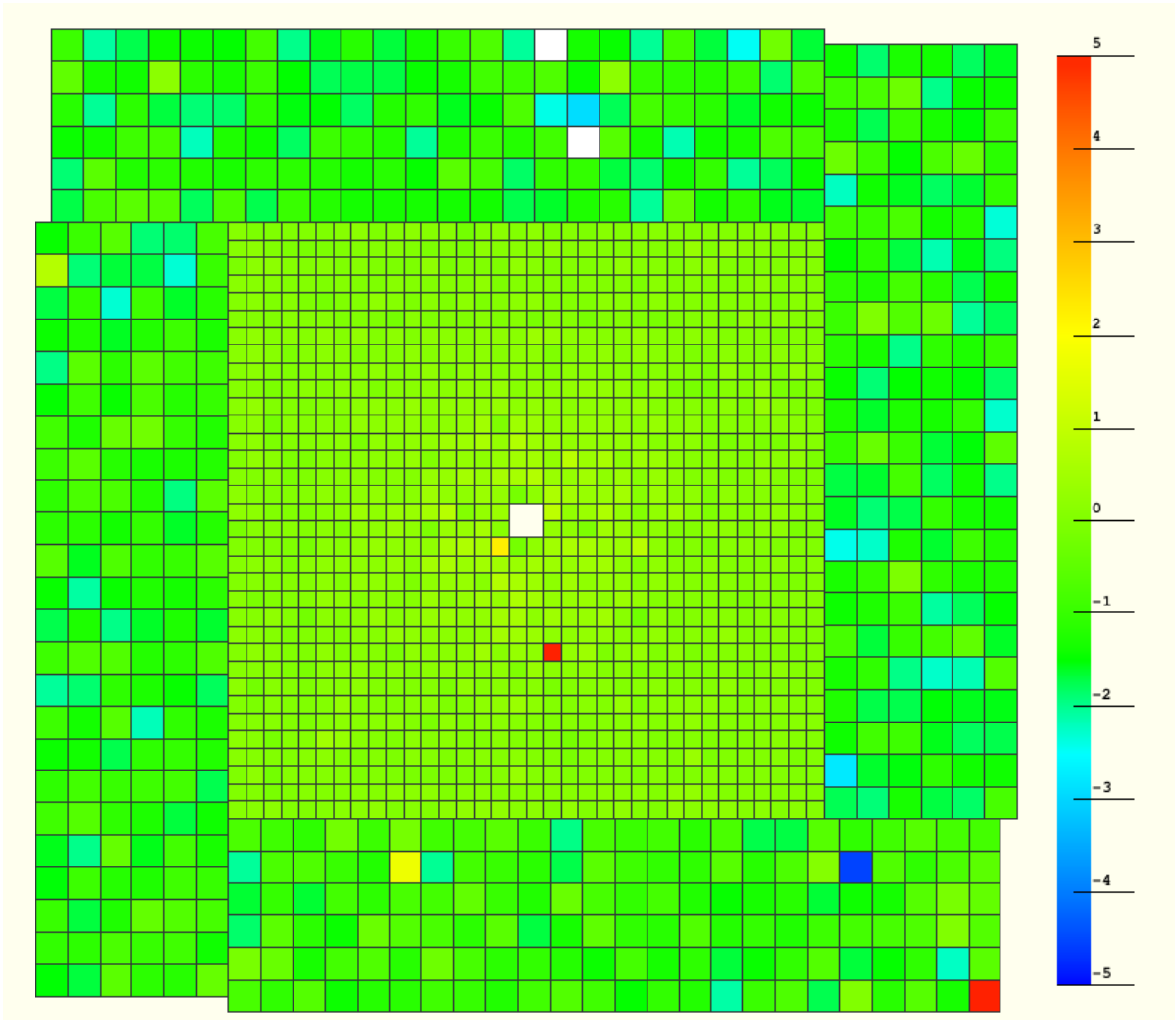
Run 1311



5%

-5%

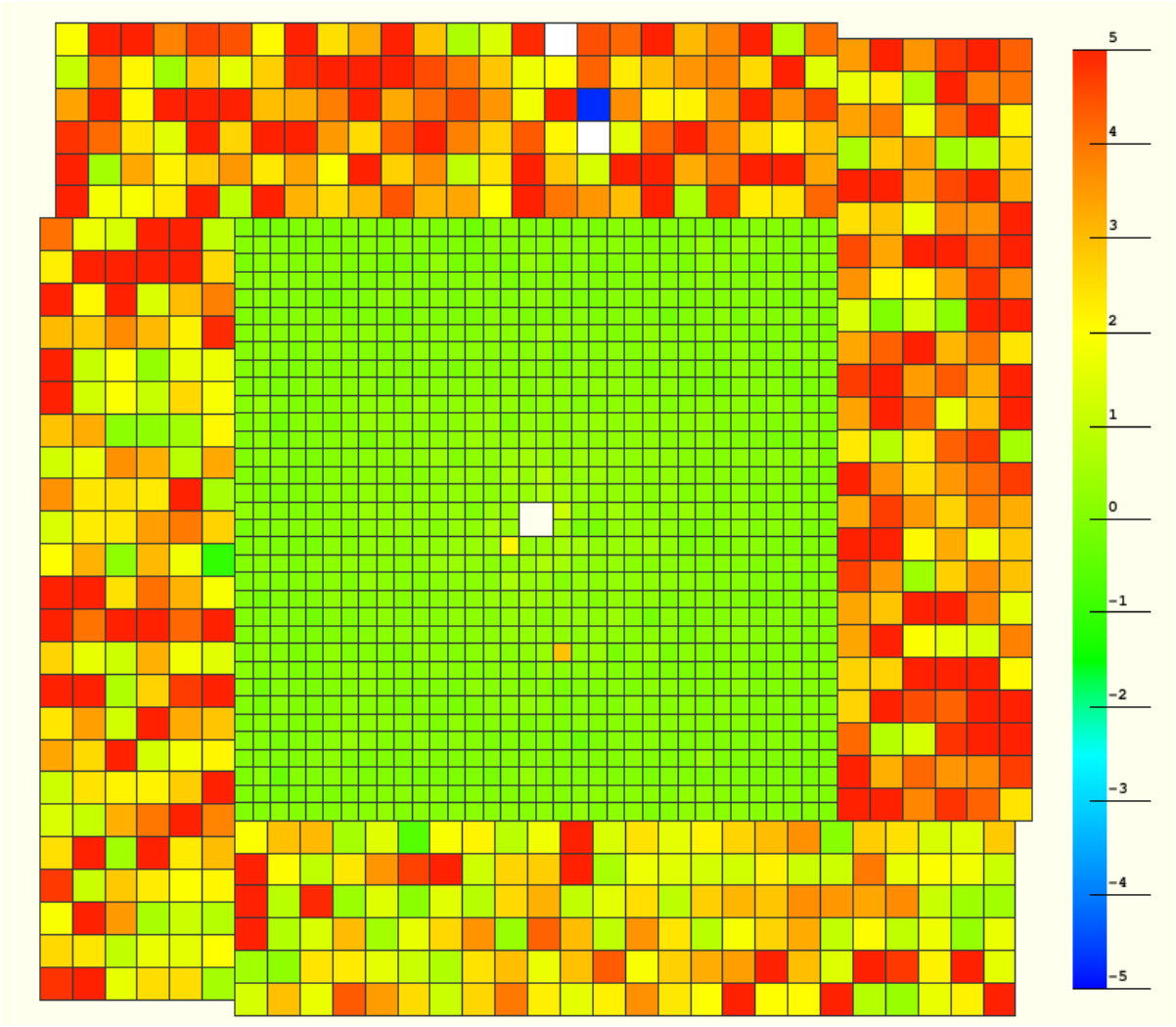
Run 1313



5%

-5%

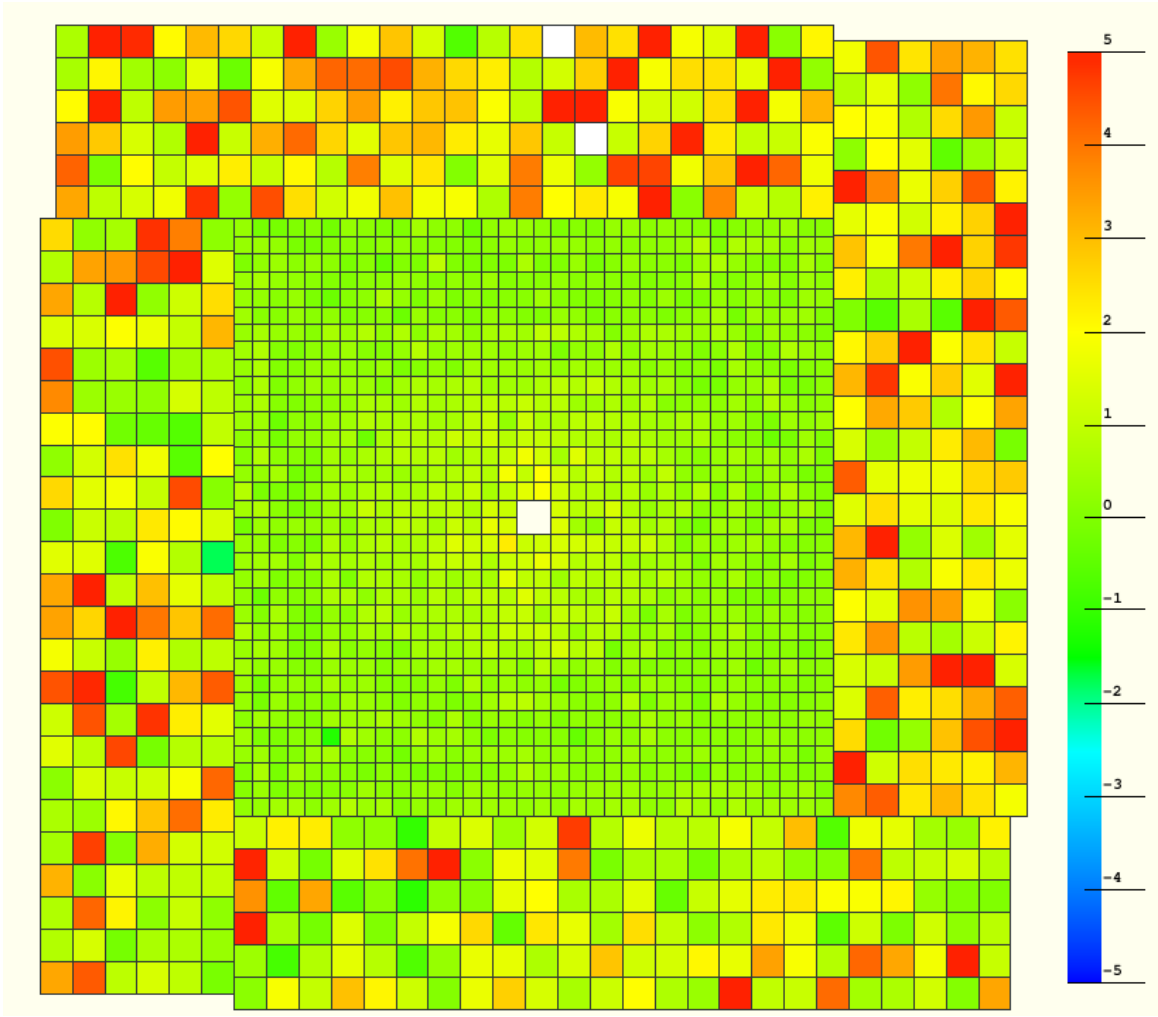
Run 1314



5%

-5%

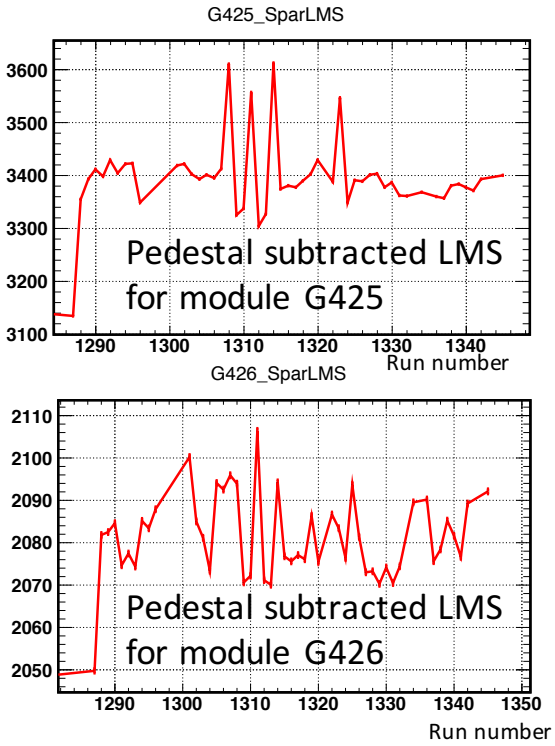
Run 1323



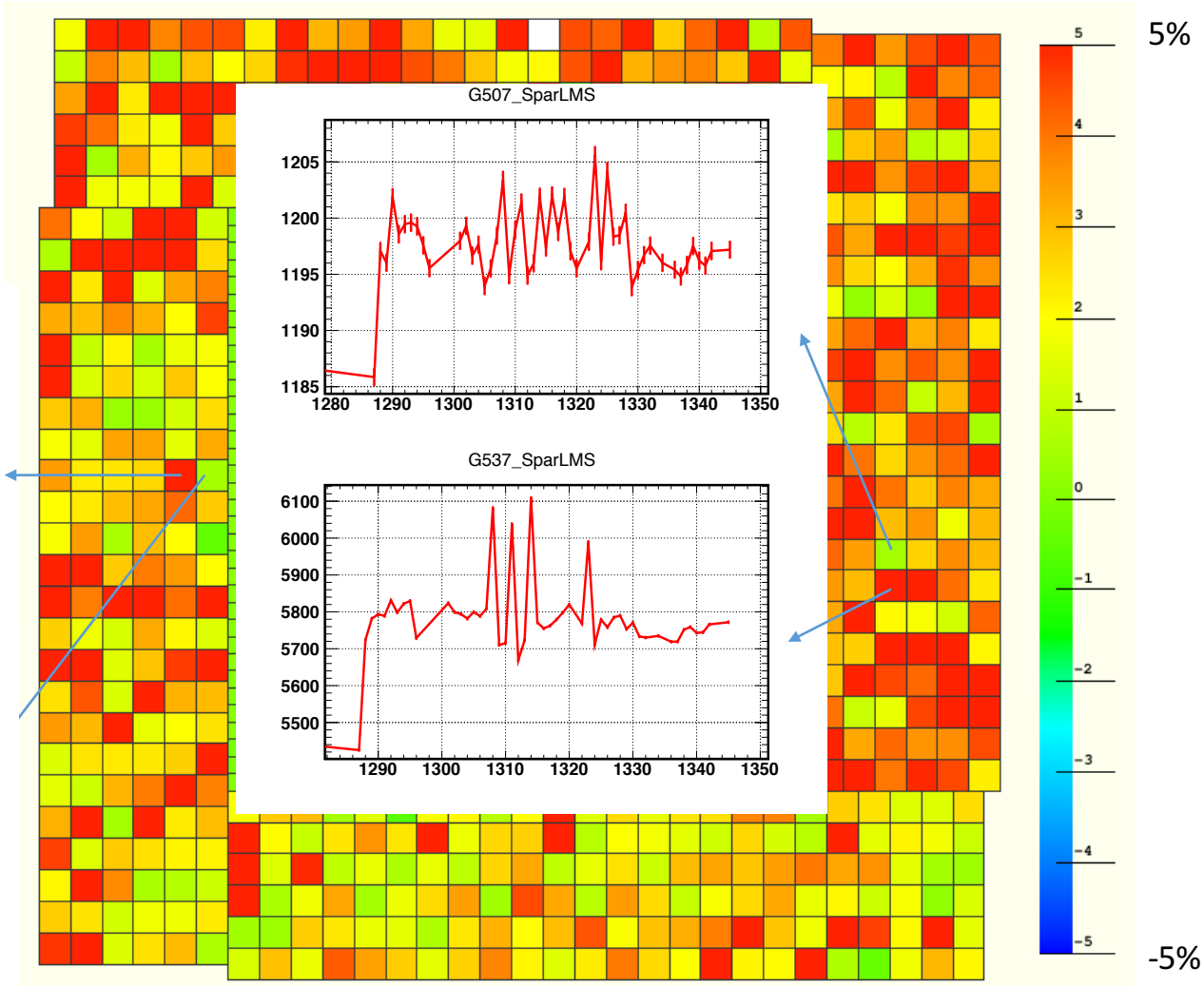
5%

-5%

- This type of fluctuation is common but not for all the LGs, there are exceptions



Run 1308



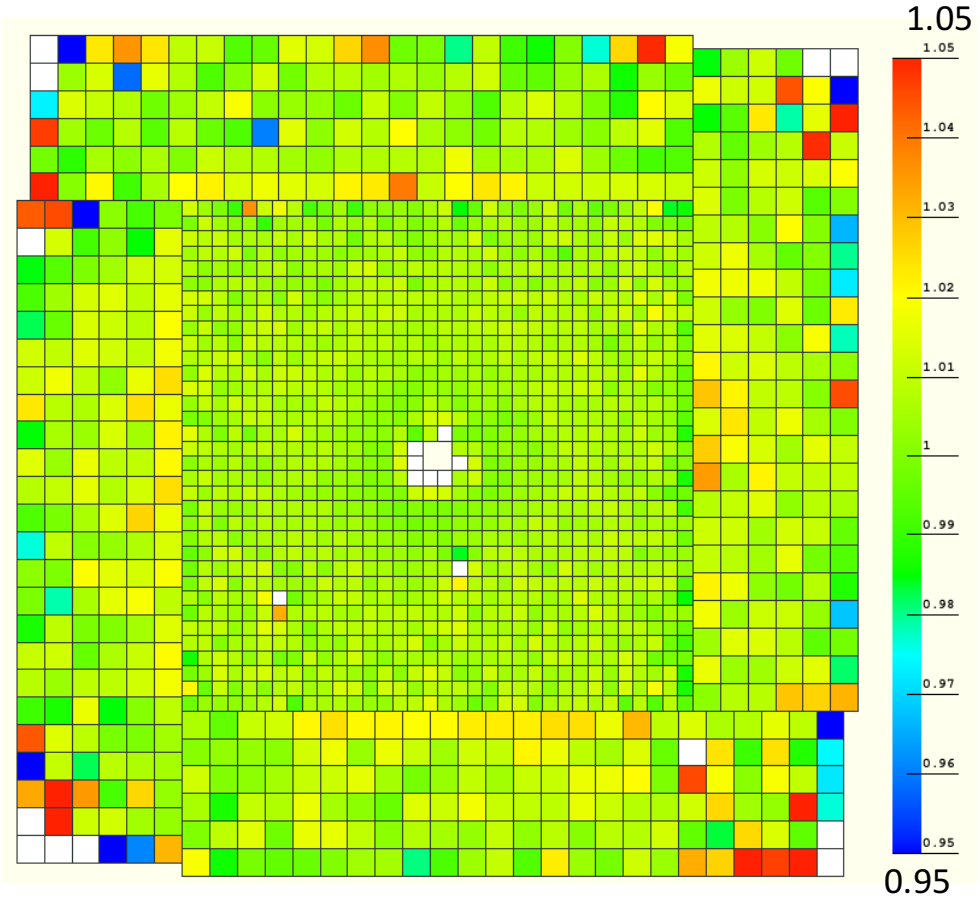
Lead Glass LMS issue continue

- We can use physics events to monitor this effect module by module as well, but only ee will have enough statistics with the data of 1 run (~10M events)
  - ee will still only have a few hundred events for each module near the edge
  - ep is at least one order of magnitude less

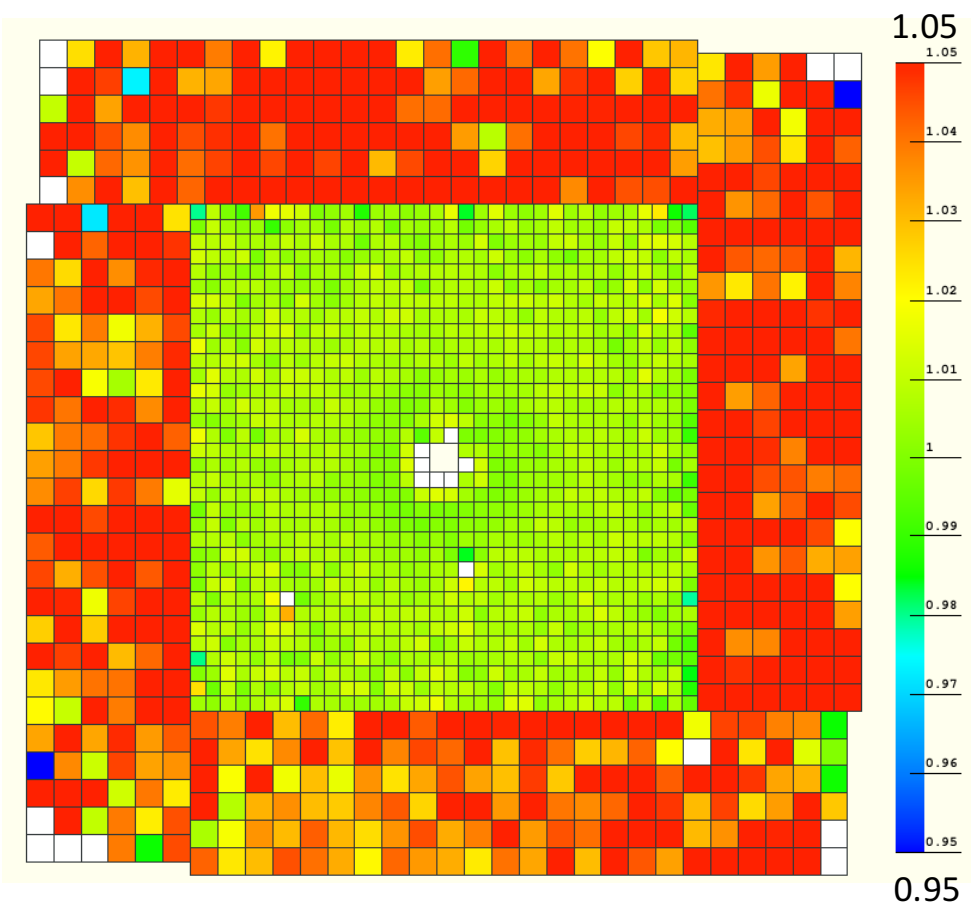
- In the following slides, I show the mean value of the ratio of (E reconstructed) / (E expected) for ee for each module, using LMS from the neighboring runs and the LMS from each run itself

Run 1287 – ee ratio

Using LMS measurement from neighboring runs for LG

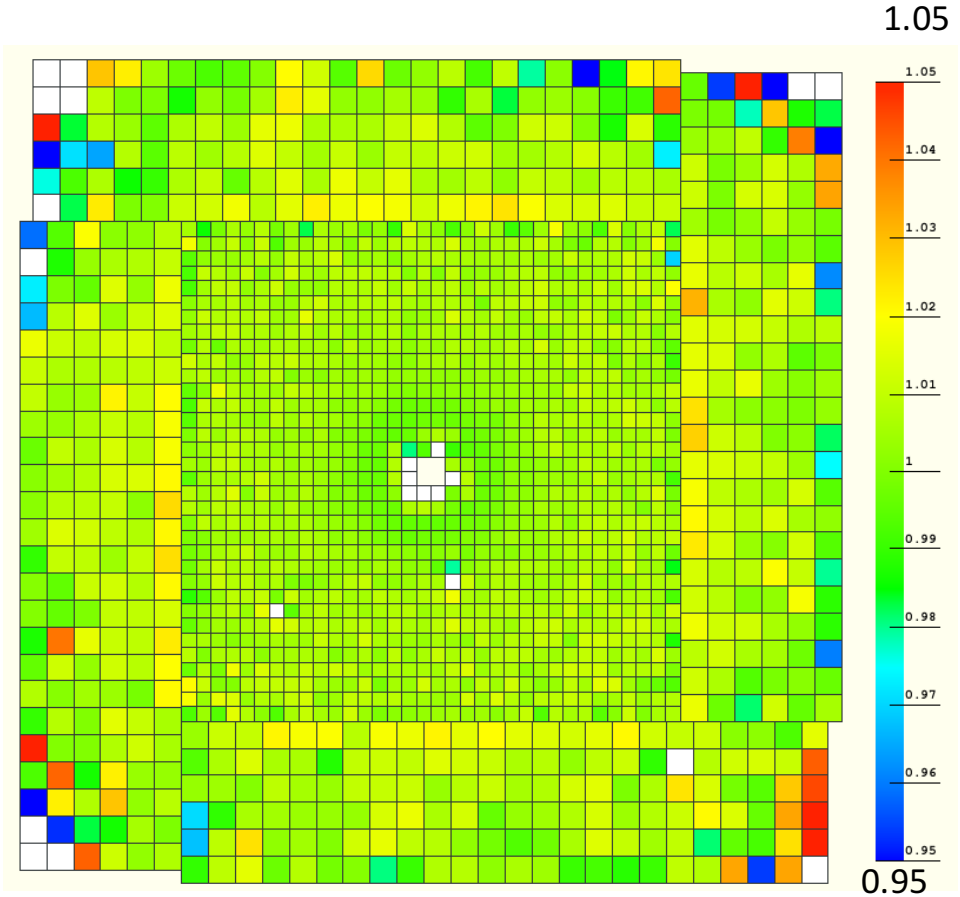


Using LMS measurement from run 1287

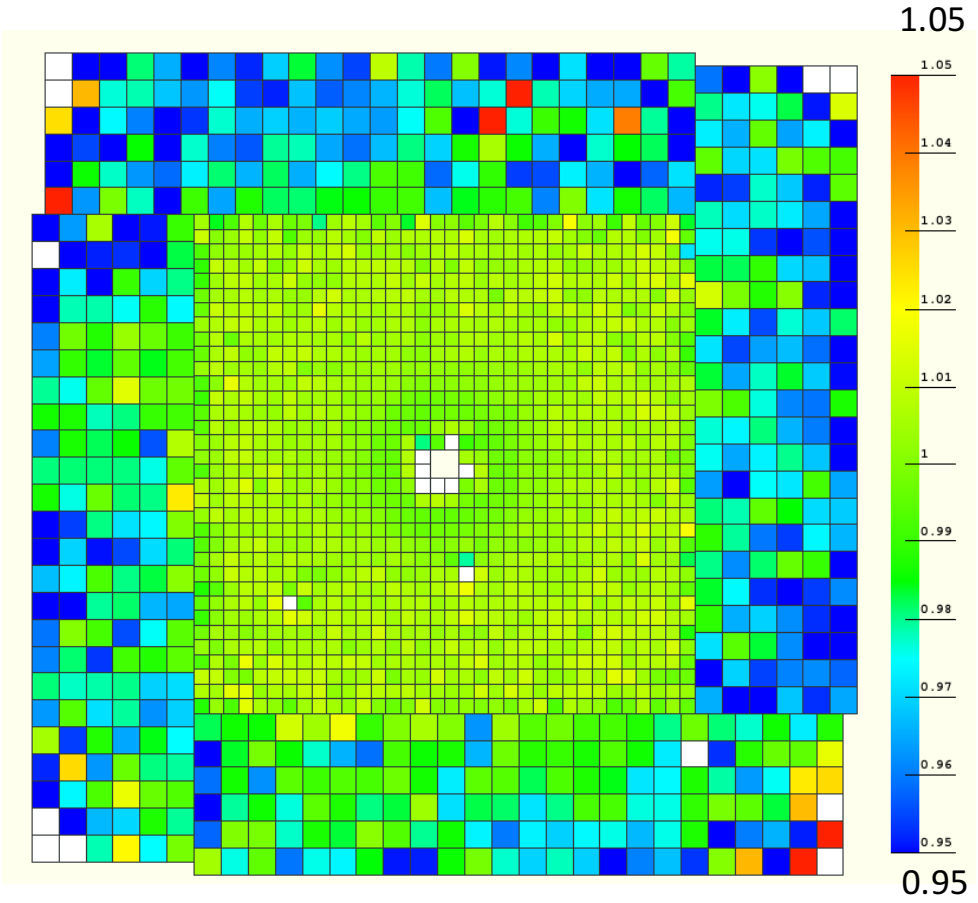


Run 1308 – ee ratio

Using LMS measurement from neighboring runs for LG

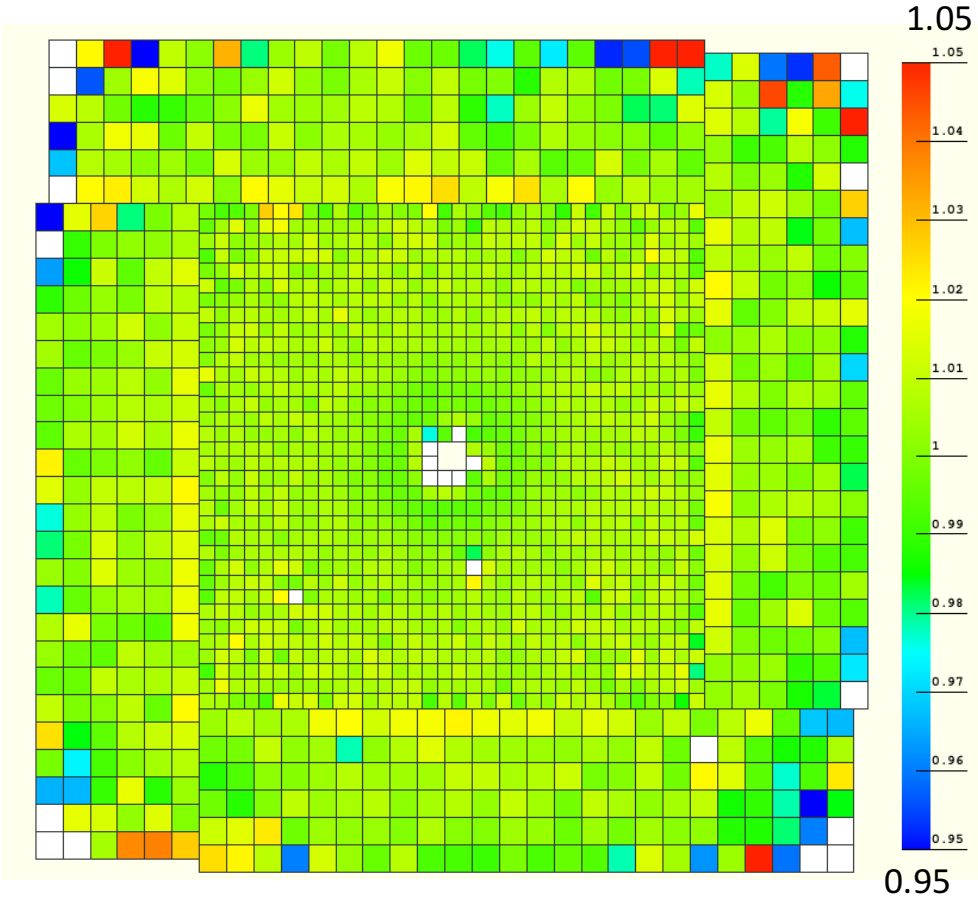


Using LMS measurement from run 1308

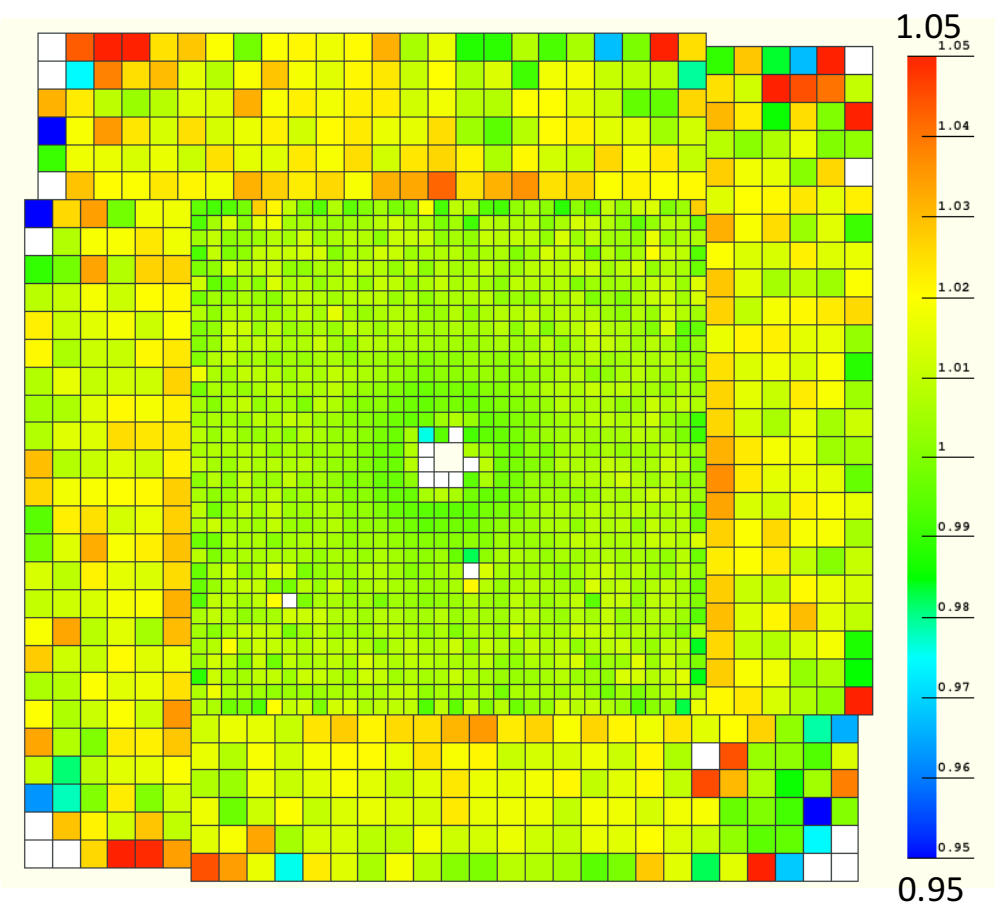


Run 1309 – ee ratio

Using LMS measurement from neighboring runs for LG



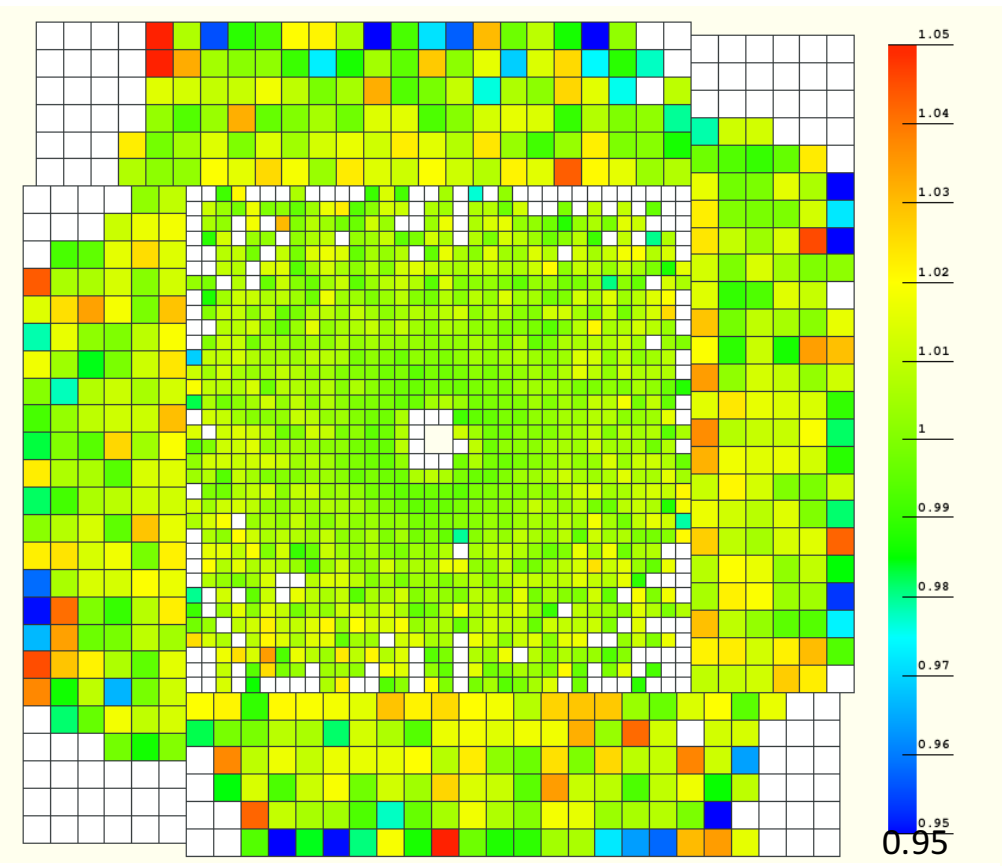
Using LMS measurement from run 1309



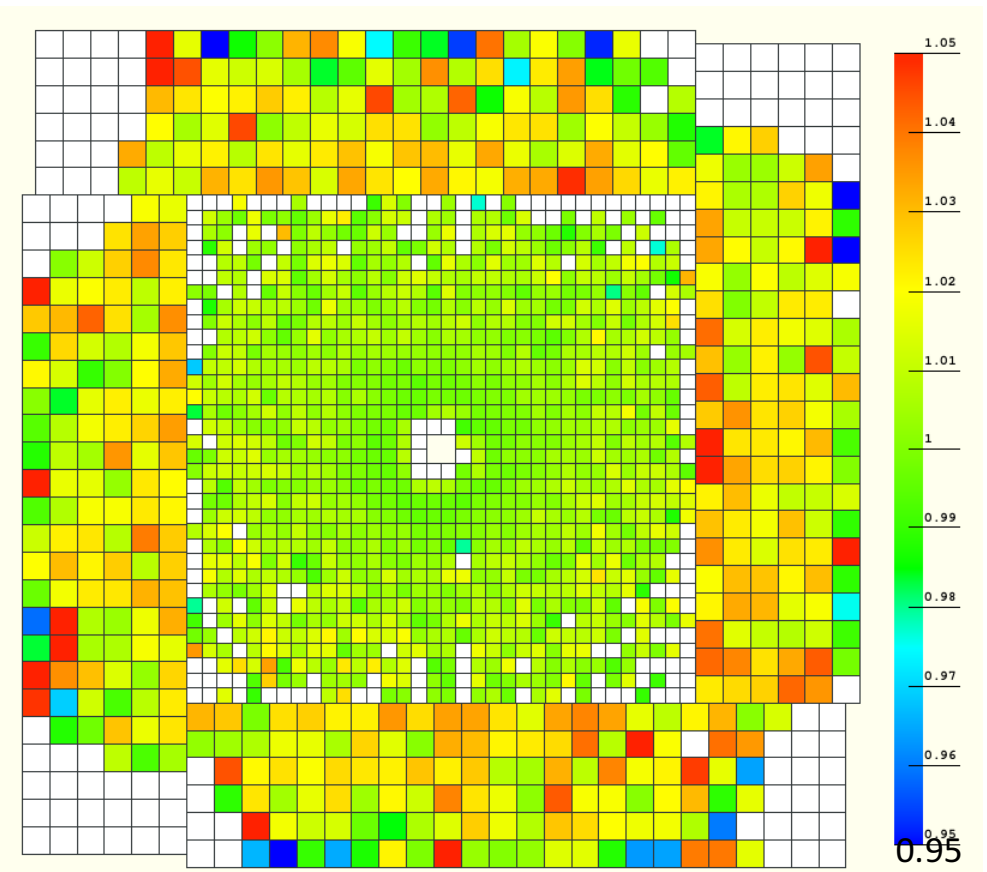
Run 1310 – ee ratio

This run doesn't have enough statistics, I require a module must have at least 100 events to be fitted

Using LMS measurement from neighboring runs for LG

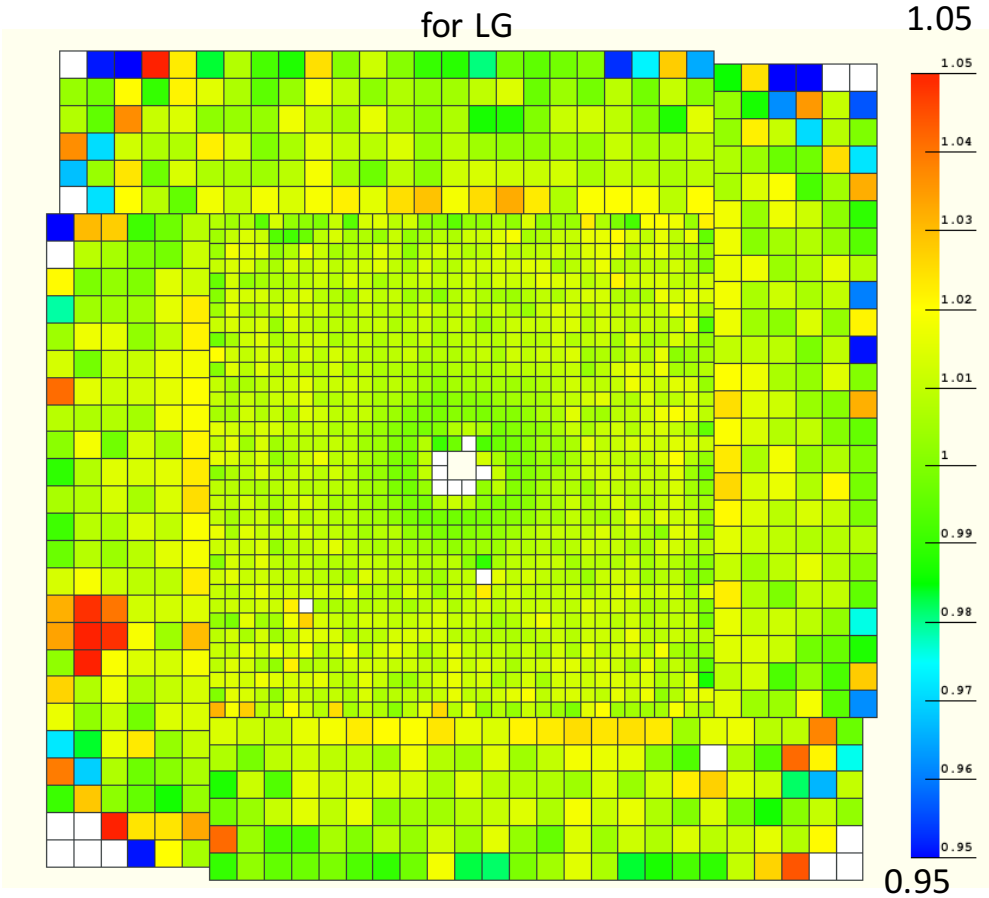


Using LMS measurement from run 1310

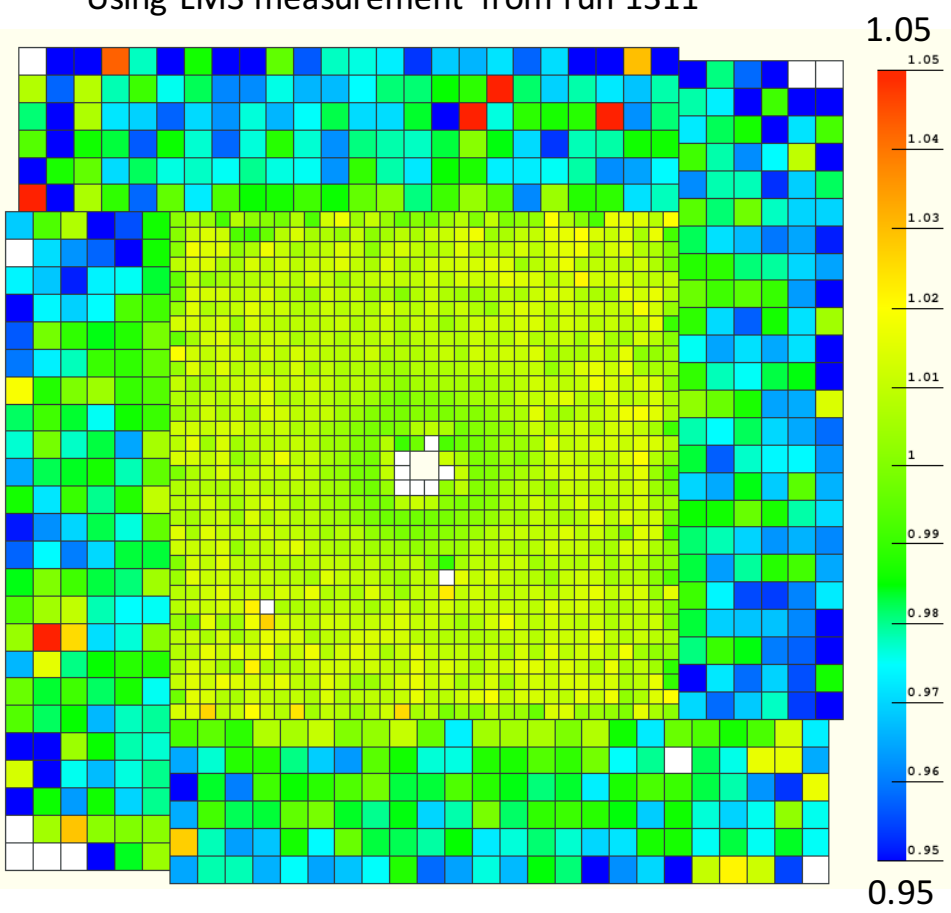


Run 1311 – ee ratio

Using LMS measurement from neighboring runs for LG

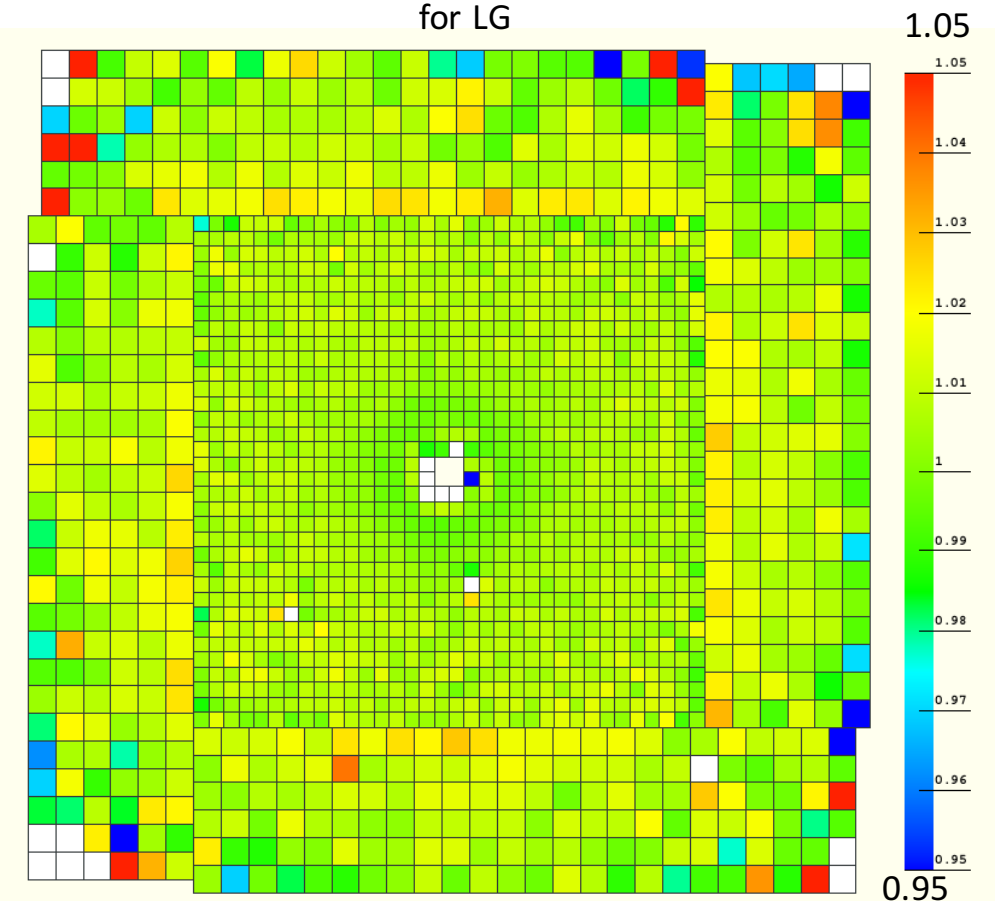


Using LMS measurement from run 1311

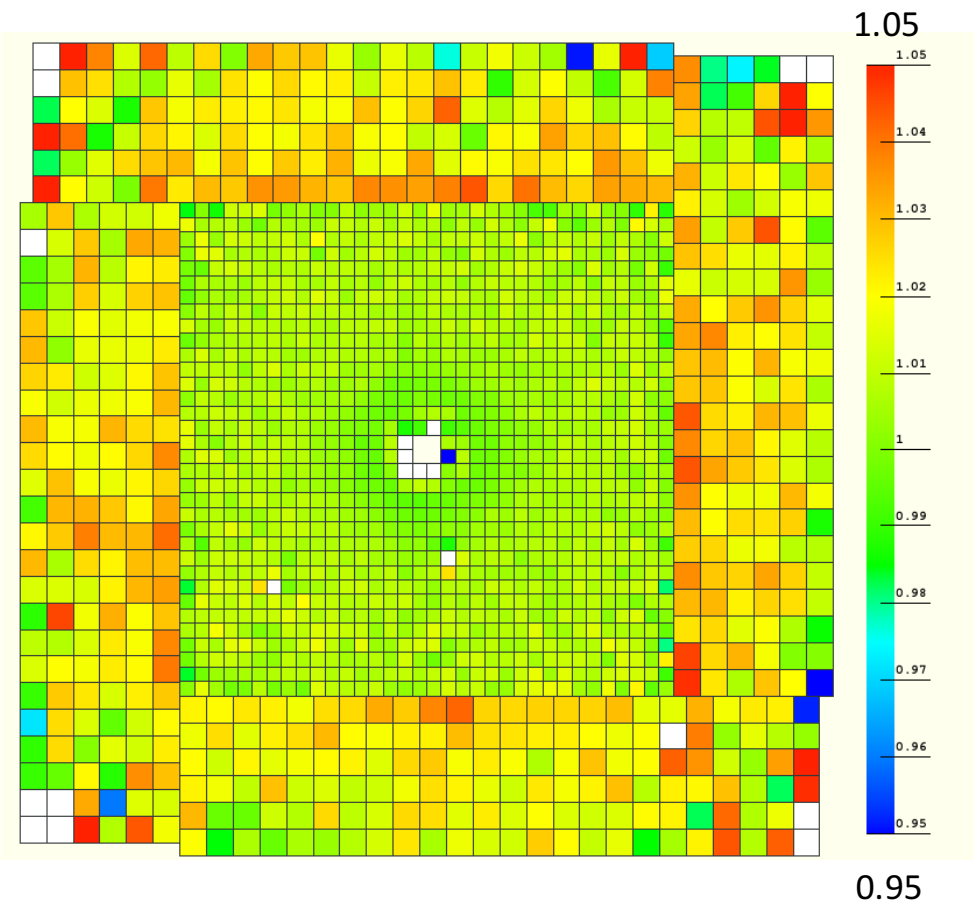


Run 1313 – ee ratio

Using LMS measurement from neighboring runs for LG

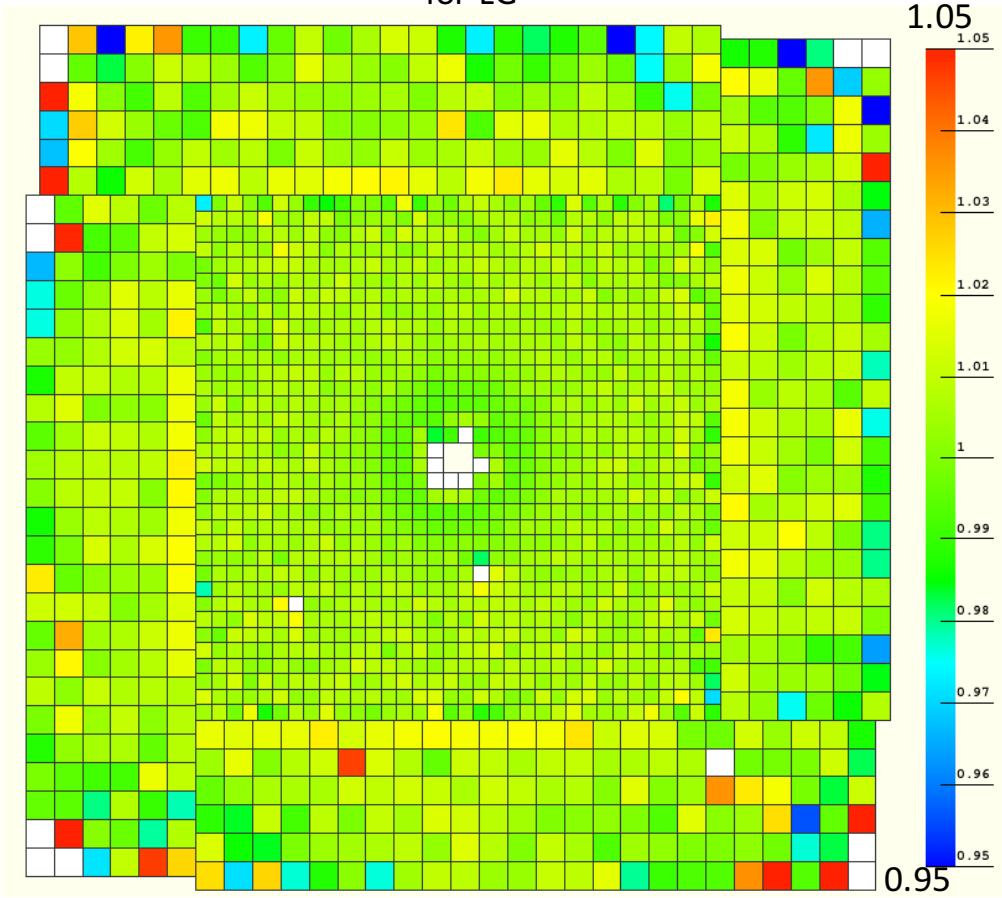


Using LMS measurement from run 1313

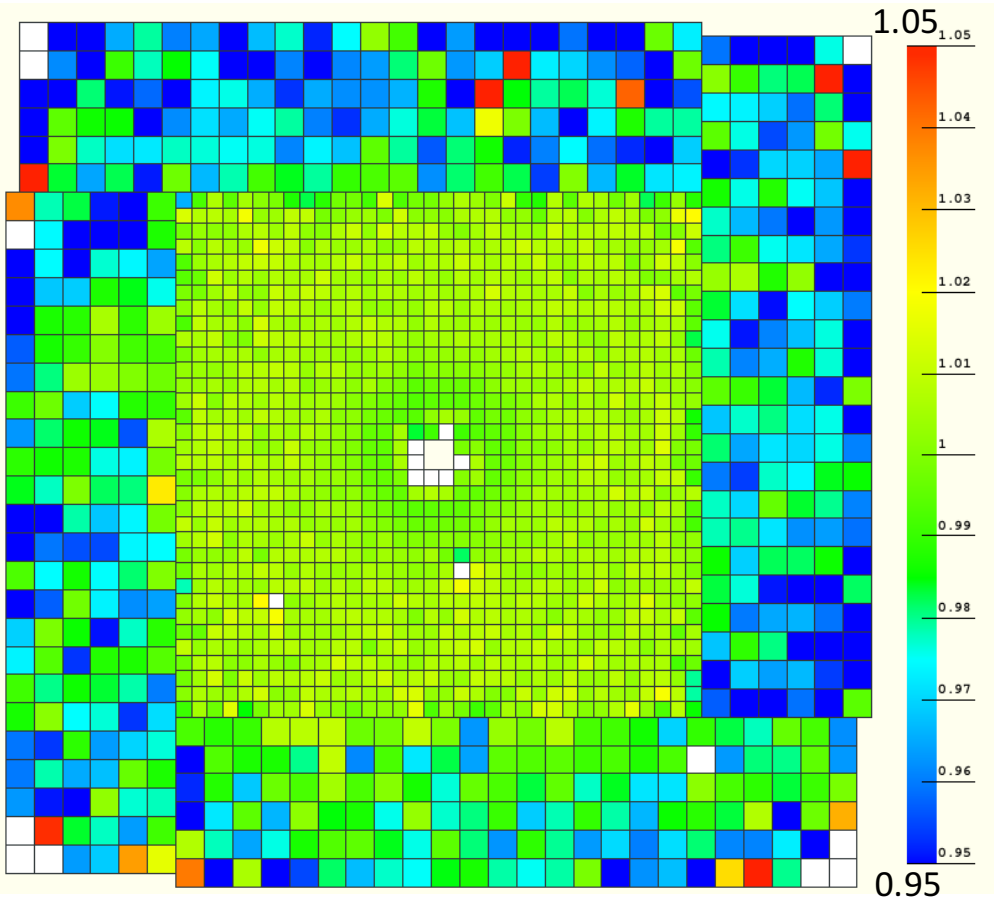


Run 1314 – ee ratio

Using LMS measurement from neighboring runs for LG

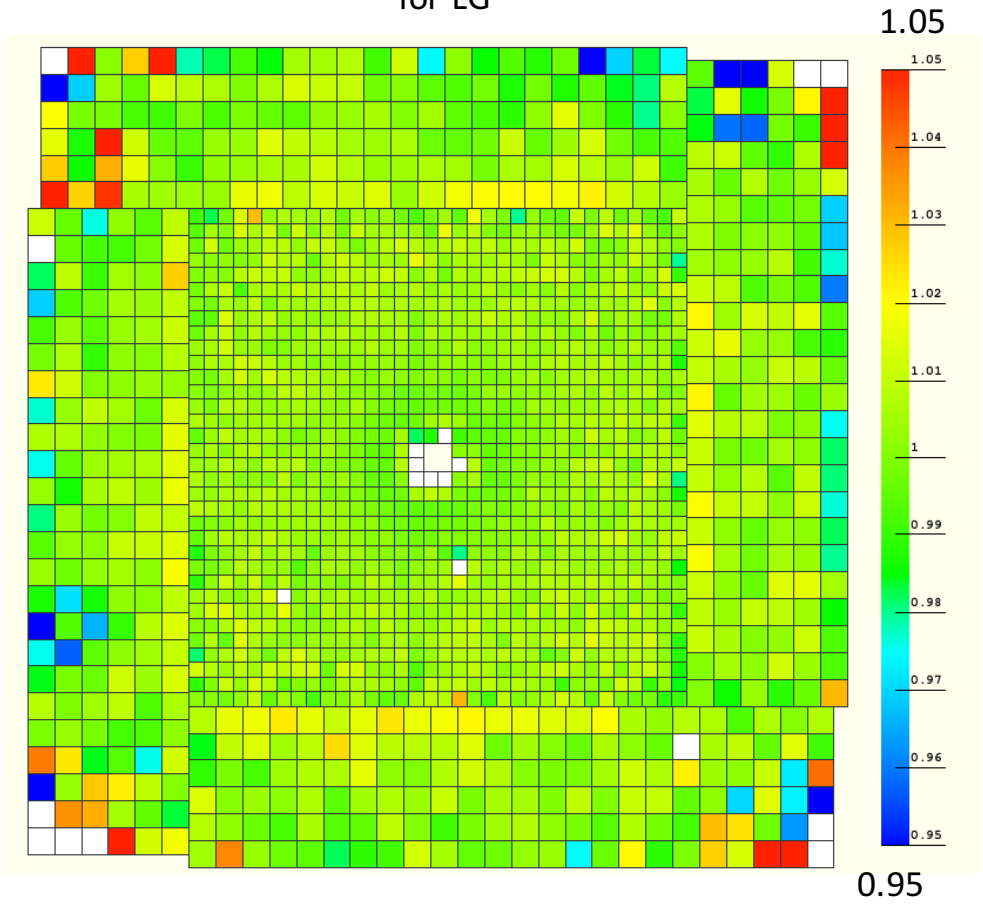


Using LMS measurement from run 1314

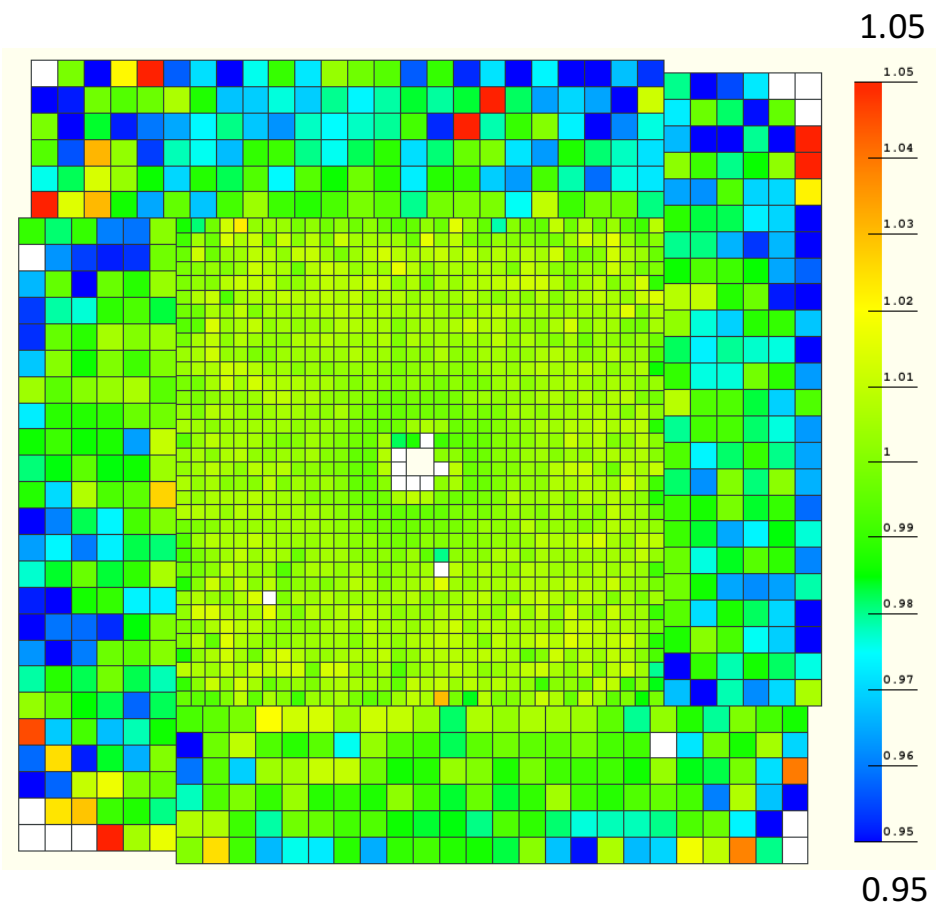


Run 1323 – ee ratio

Using LMS measurement from neighboring runs for LG



Using LMS measurement from run 1323



Lead Glass LMS issue continue

- This LMS fluctuation does not seem to appear in the calibration period 1443 to 1516 of the 2.2GeV runs, the following two plots show the ratio of (E reconstructed) / (E expected) as a function of run number