# Cosmic run, slab 20 (covered from light), 5 May, spill 450 msec, 2 Hz, threshold 225

V.Balagura, TB preparation meeting, LAL, 16 May 2017

Retriggers: most dangerous if propagated from one chip to another (chips "talk" to each other). Below, N retriggers per chip: blue (max=15 due to #SCA) and per slab: red. For the latter, retriggers are formed across triggered BX's in all chips. Red peak at 14 is due to "cross talk" between chips.
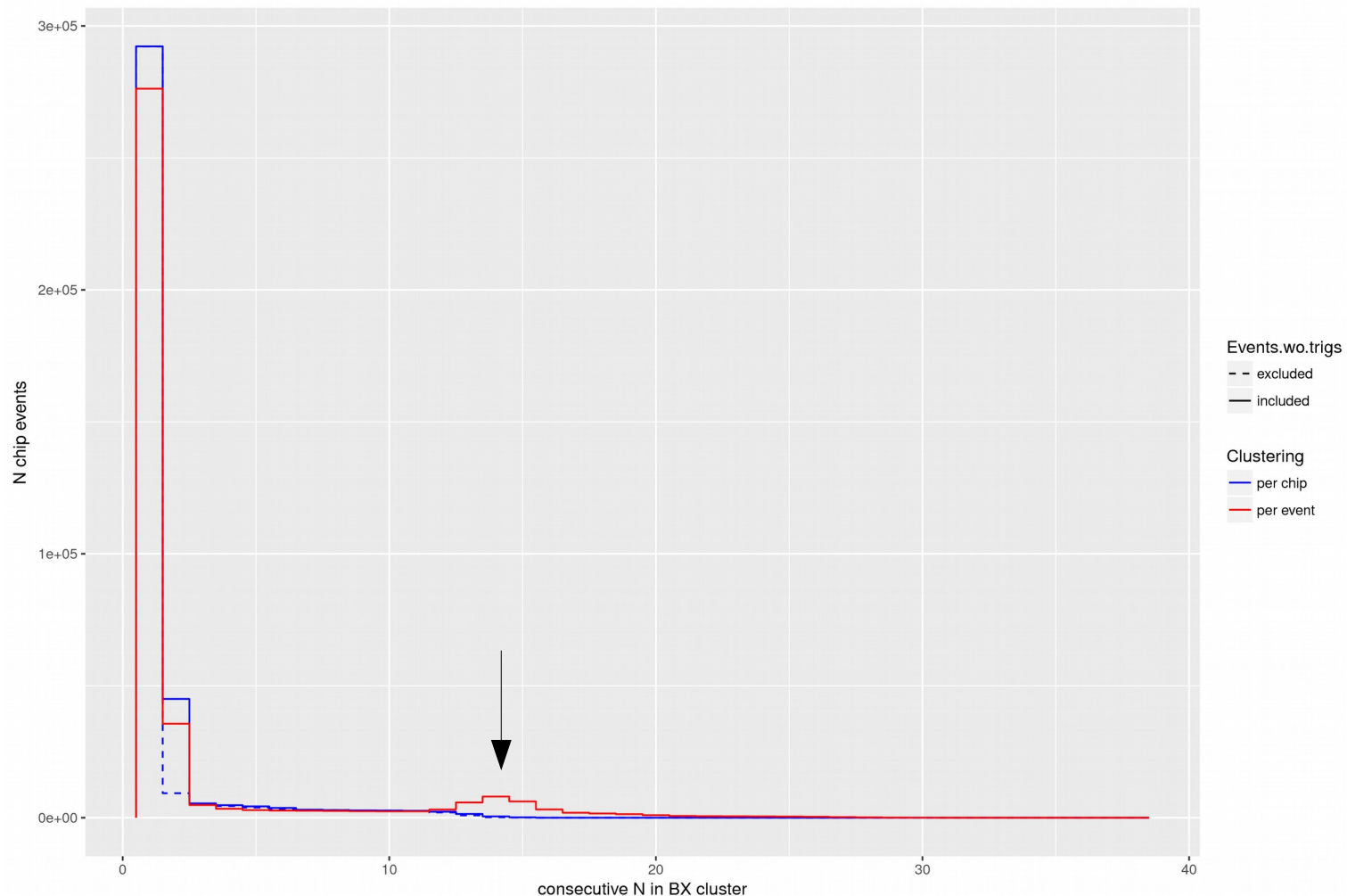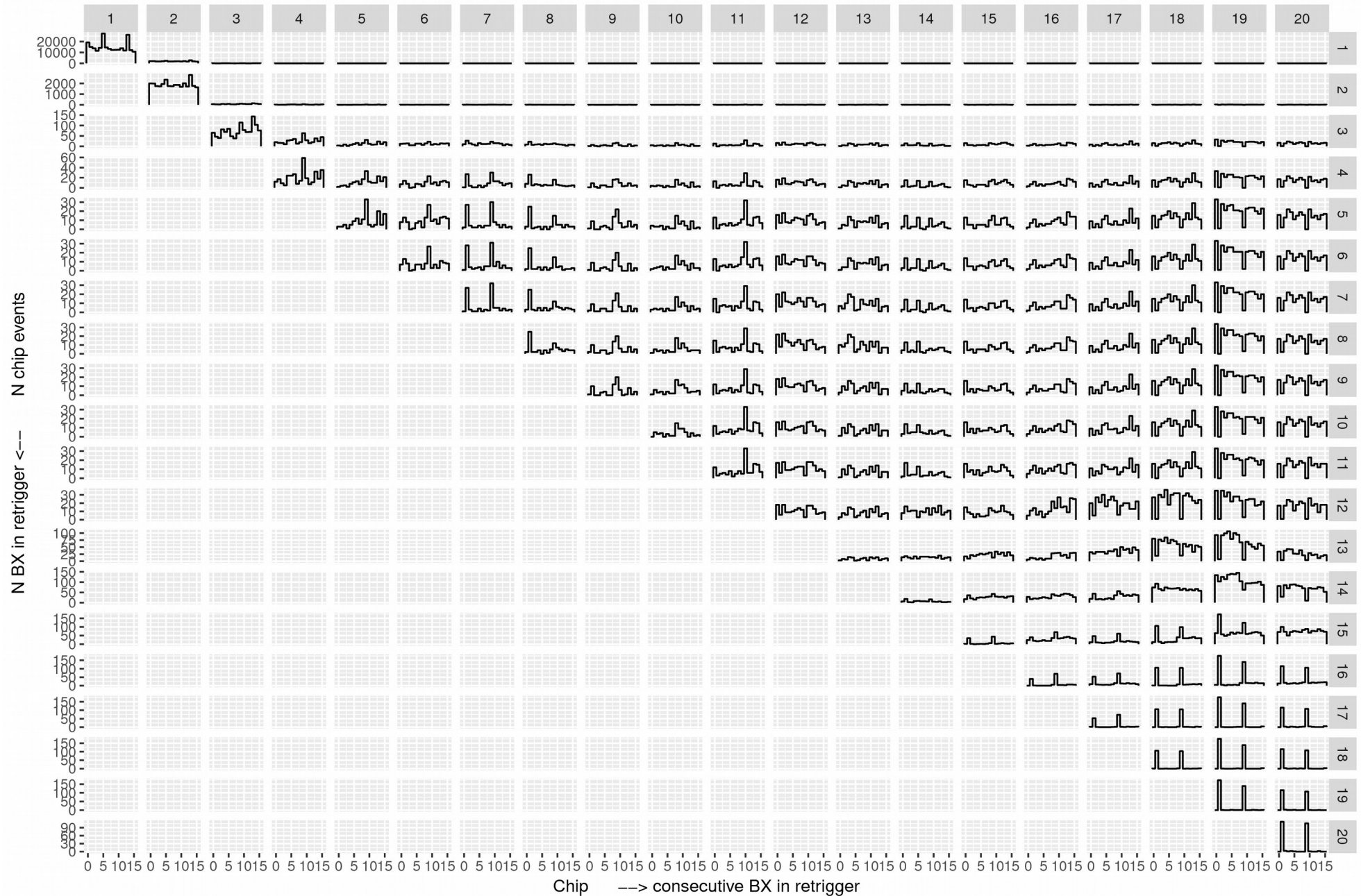
Same per chip and only for "macro" events with >=10 BX's

Note activity in chips 1 and 9.
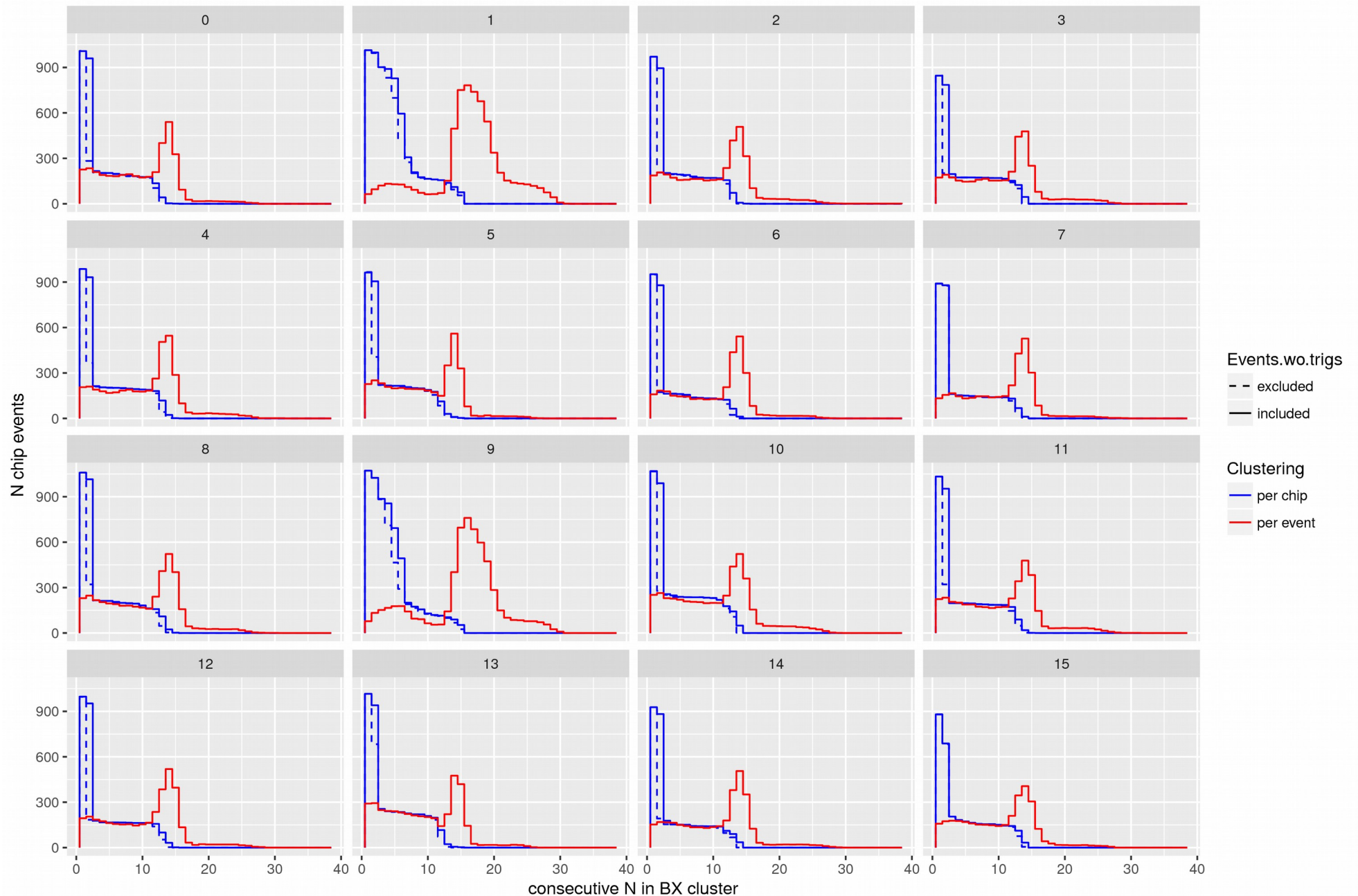
N chip events versus chip number; grid: length of "macro" event (vertical) versus consecutive BX number (horiz.)

This chip "occupancy" depends rather on consecutive BX number but not on "macro" event length (!)

"Macro" event length >= 10 BX's, consecutive BX numbers are grouped (1, 2, 3-7, ...); pixel N trig. / max N trig. in group
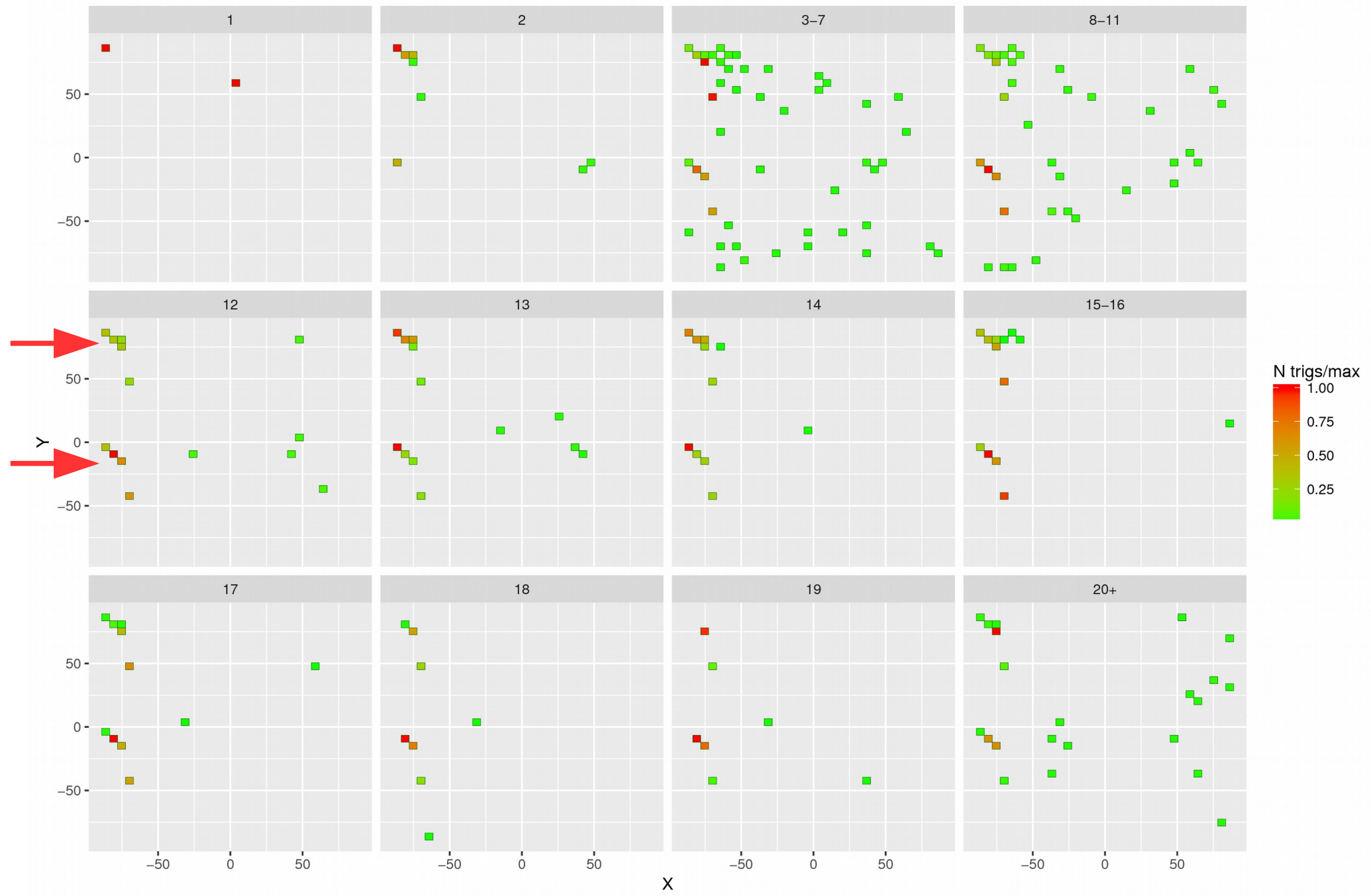
Division by max(N trigs) makes features better pronounced. 3 players are visible: crosses around ch. 37 in all chips, chips 1, 9 (top left in two halves), "diagonal" trace from top corner in those chips (see later)
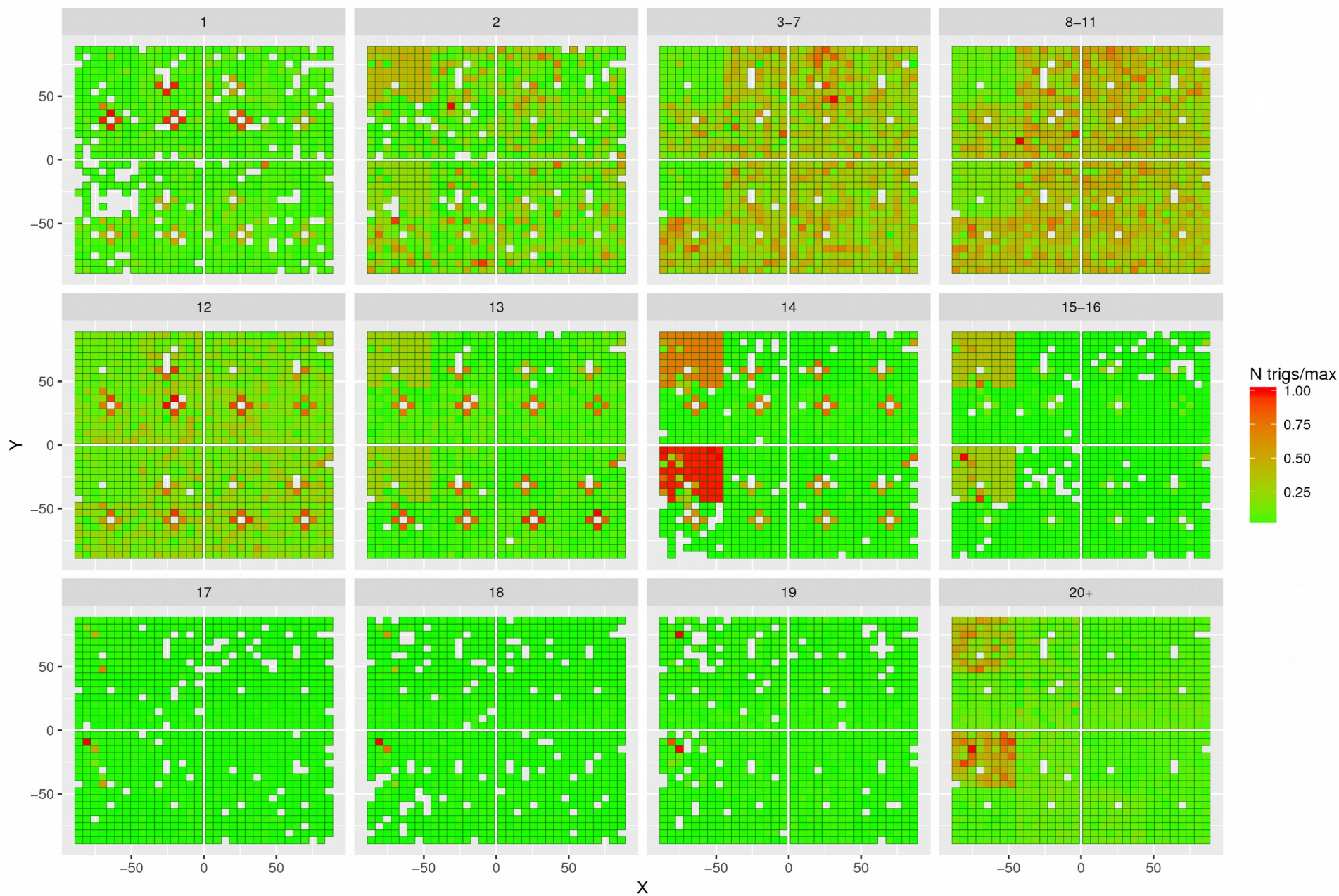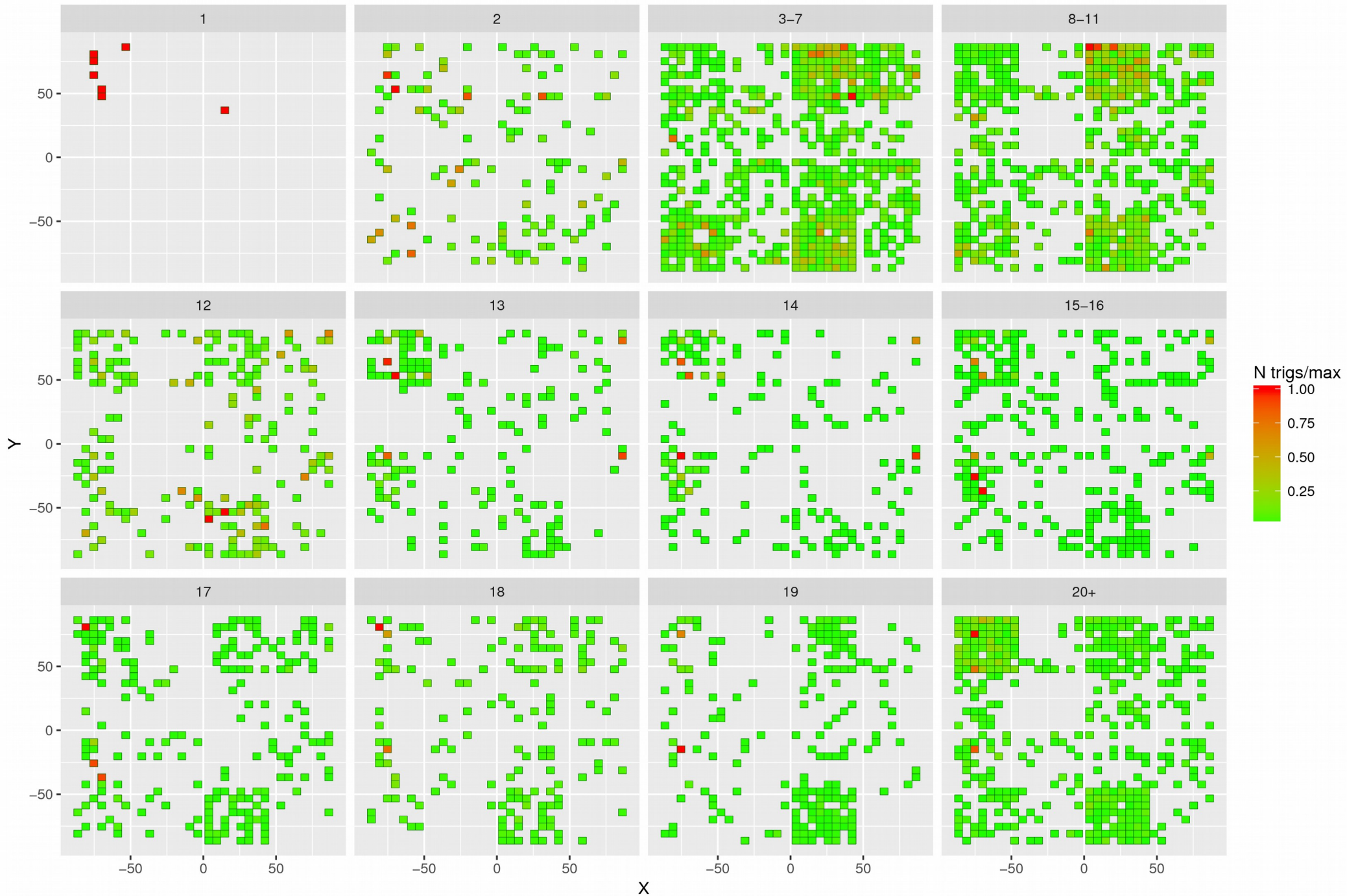
Same, but considering only negative triggers with ADC<10

"Diagonal" trace from top corner in chips 1 and 9.
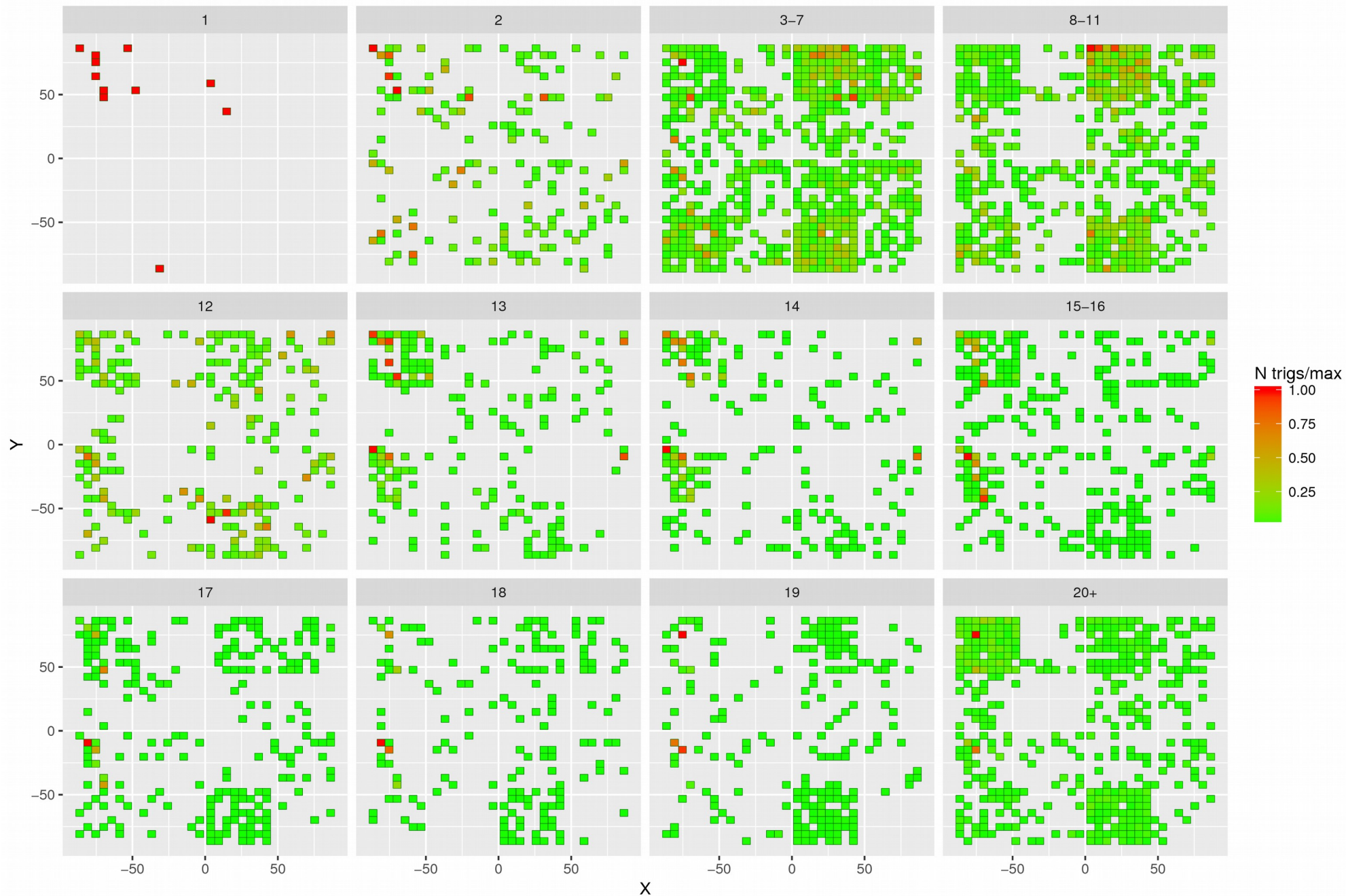
# Same, less negative triggers with ADC>=10, ADC-pedestal<-20

Nothing well pronounced

Same, slightly negative signals: -20 <= ADC-pedestal < -5

Nothing well pronounced

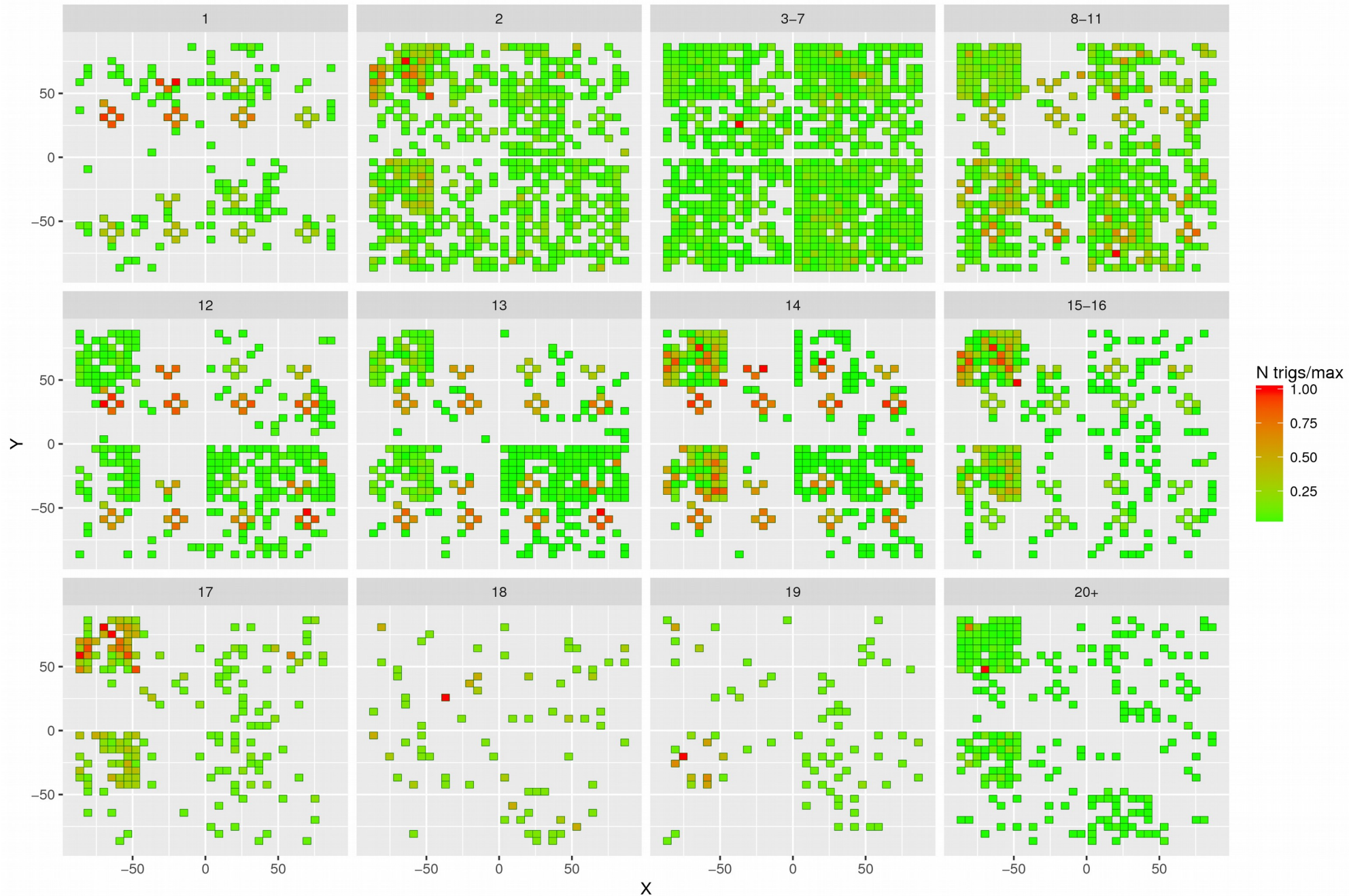# Same, signals around zero: -5 <= ADC-pedestal < 5

Majority of pixels in chips 1 and 9 have zero signals (except those with strongly negative). Signals in crosses around ch.37 are slightly positive (see this and next slide).
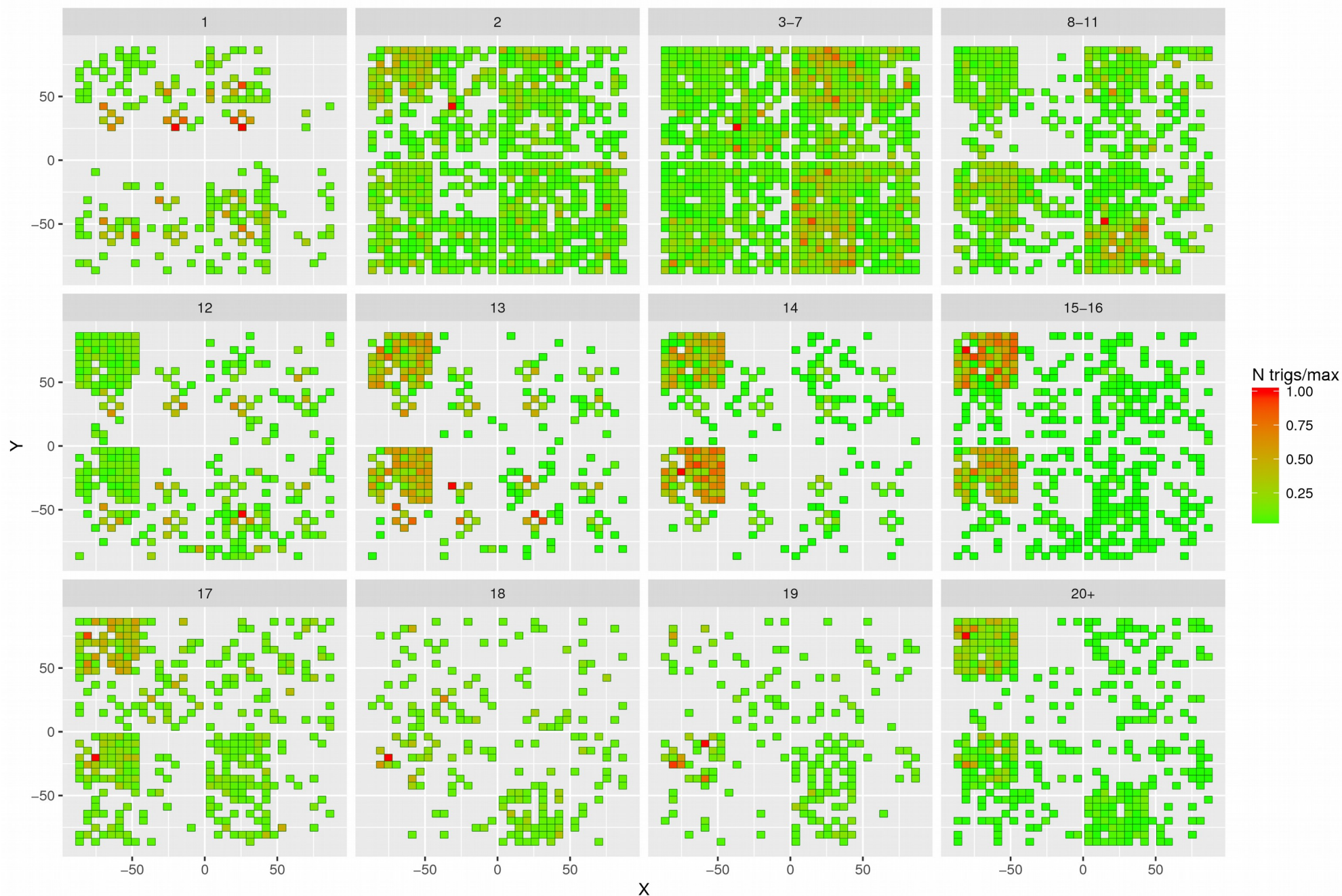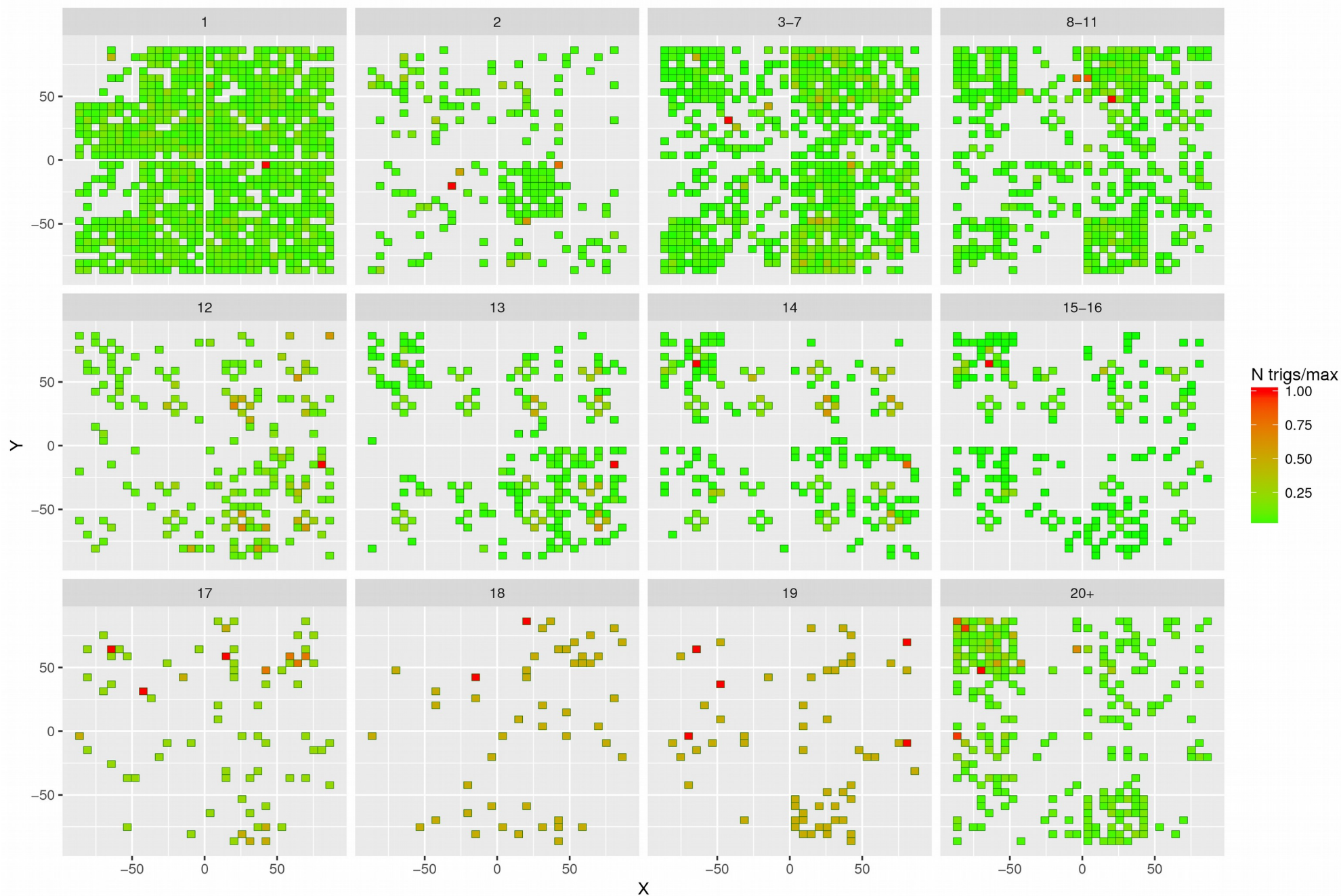
Same, slightly positive signals: 5 <= ADC-pedestal < 20

Crosses around ch.37 are slightly positive (see this and previous slide).

Same, positive signals: 20 <= ADC-pedestal

Patterns disappear.

Conclusions

Cosmics in slabs 20, 15: good, threshold 225 is possible.

In small fraction of events retriggers propagate from one chip to another (dangerous).

Patterns are visible in such "macro" events with length >=10 BX

Patterns rather depend on consecutive BX number, not on macro event length (as if they exist regardless whether we trigger them or not)

3 patterns are pronounced and are correlated with dangerous retriggering:
- negative signals along diagonal in chips 1,9
- the rest of pixels in chips 1,9
- crosses around channel 37 in all chips (channel 37 itself is masked).

Evolution of retriggers in time:

Shown plots are added to list of histograms in online_monitor (in R).