Preliminary Luminosity Data Analisys

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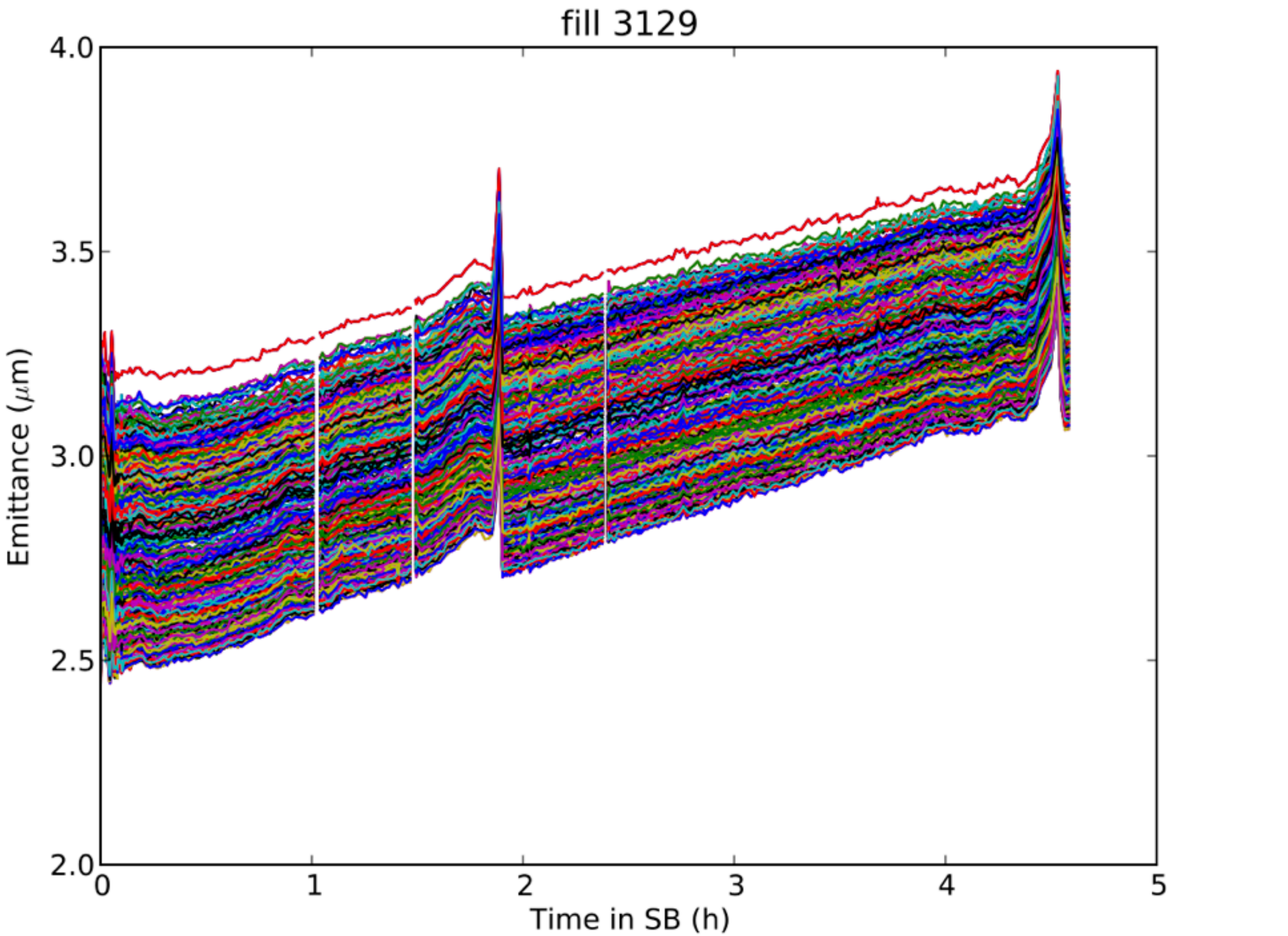
Acknowledgment: X.Buffat

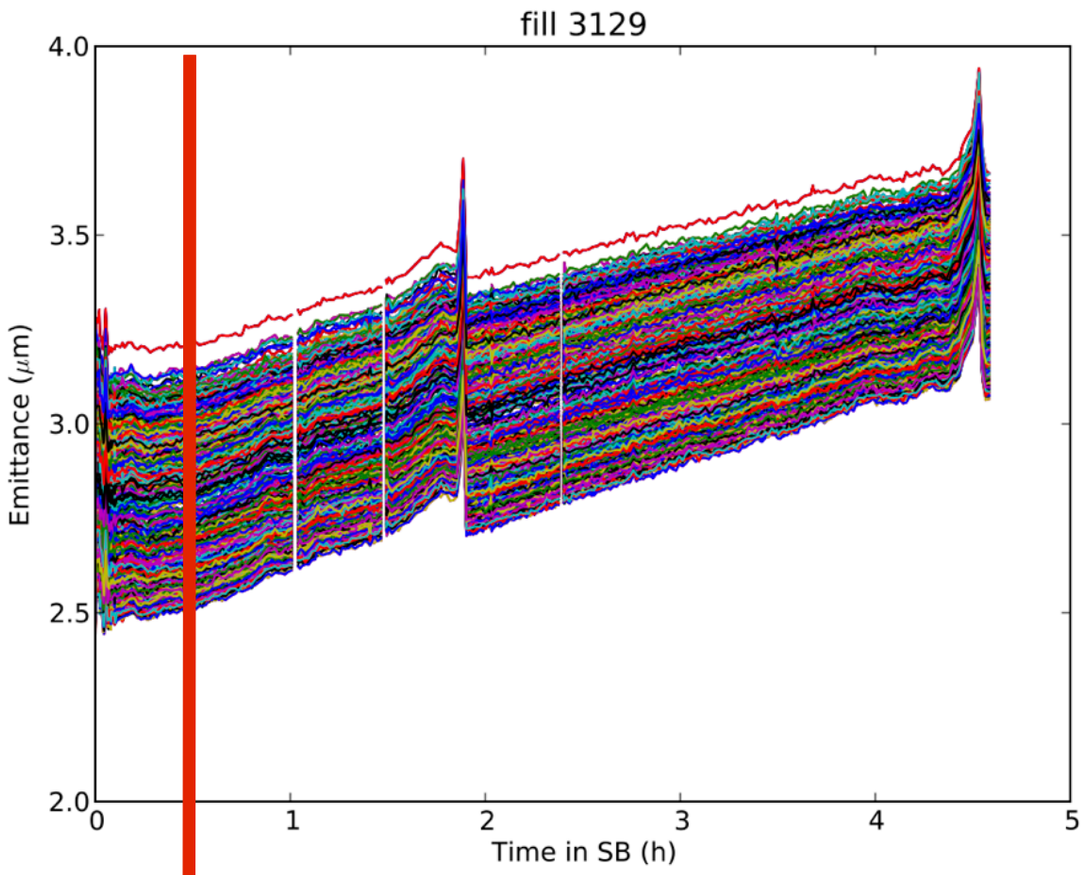
High Luminosity LHC

LHC@home SixTrack

Lumi from ATLAS: fill 3129

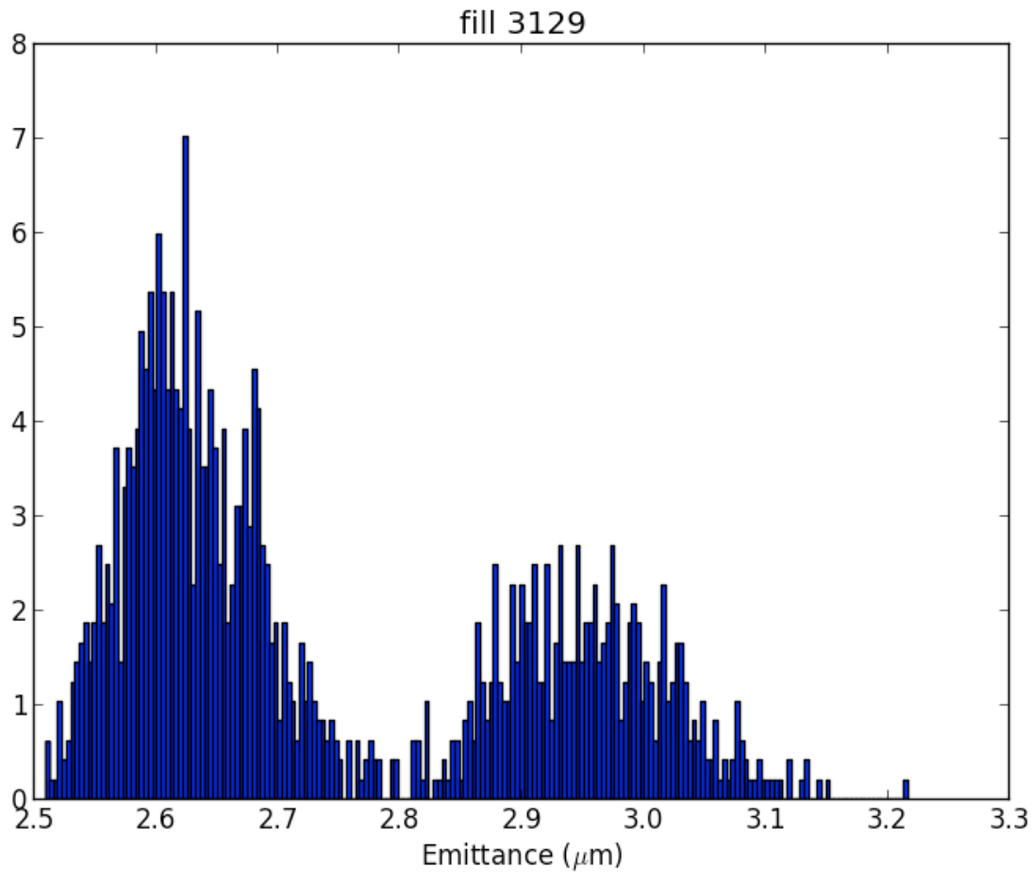


The 2 Families

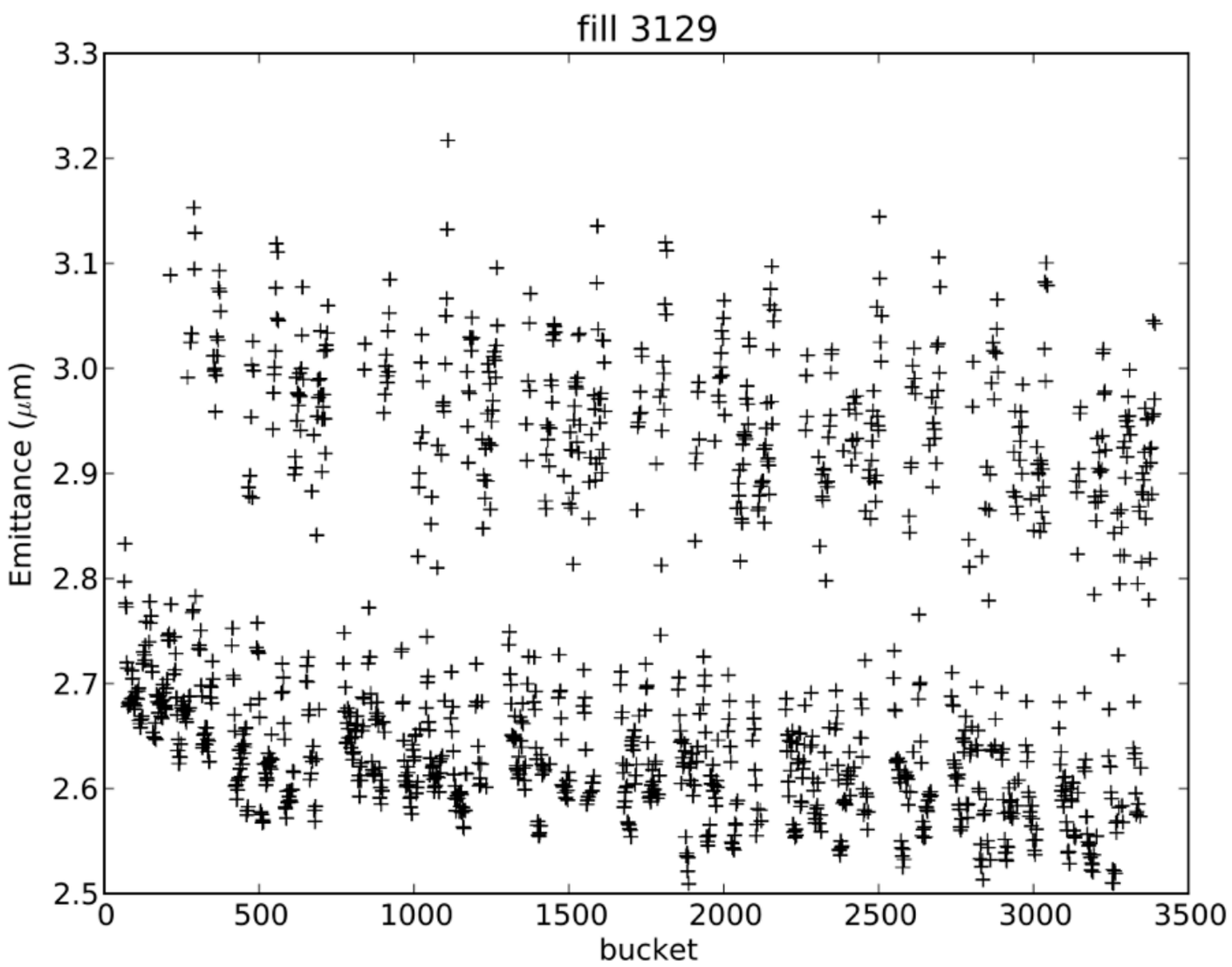


Emittance for fill 3129 show clearly 2 families. Which are the blown-up bunches?

30min



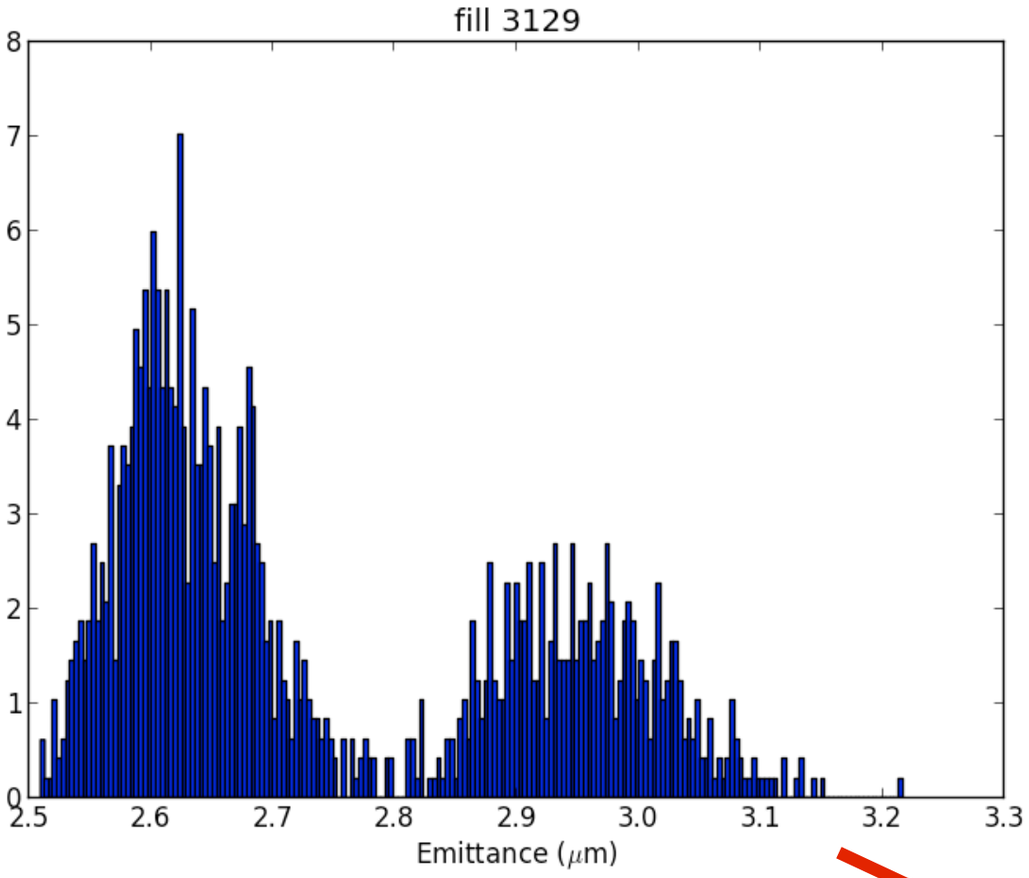
How to split?



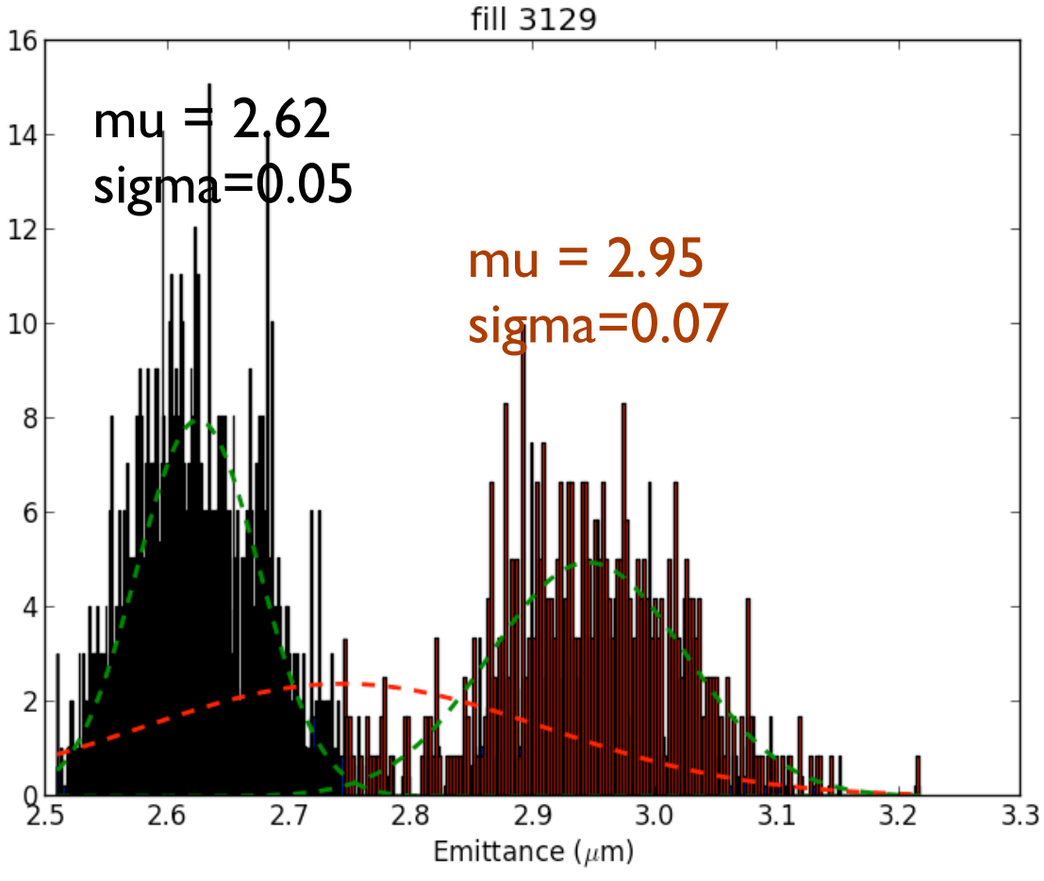
Emittance of all bunches for fill 3129 after 30 min in StableBeam:
two families are clearly visible.
Can we find a way to determine which bunches are blown-up?
Automatically, obviously...

Lets go back to distributions...

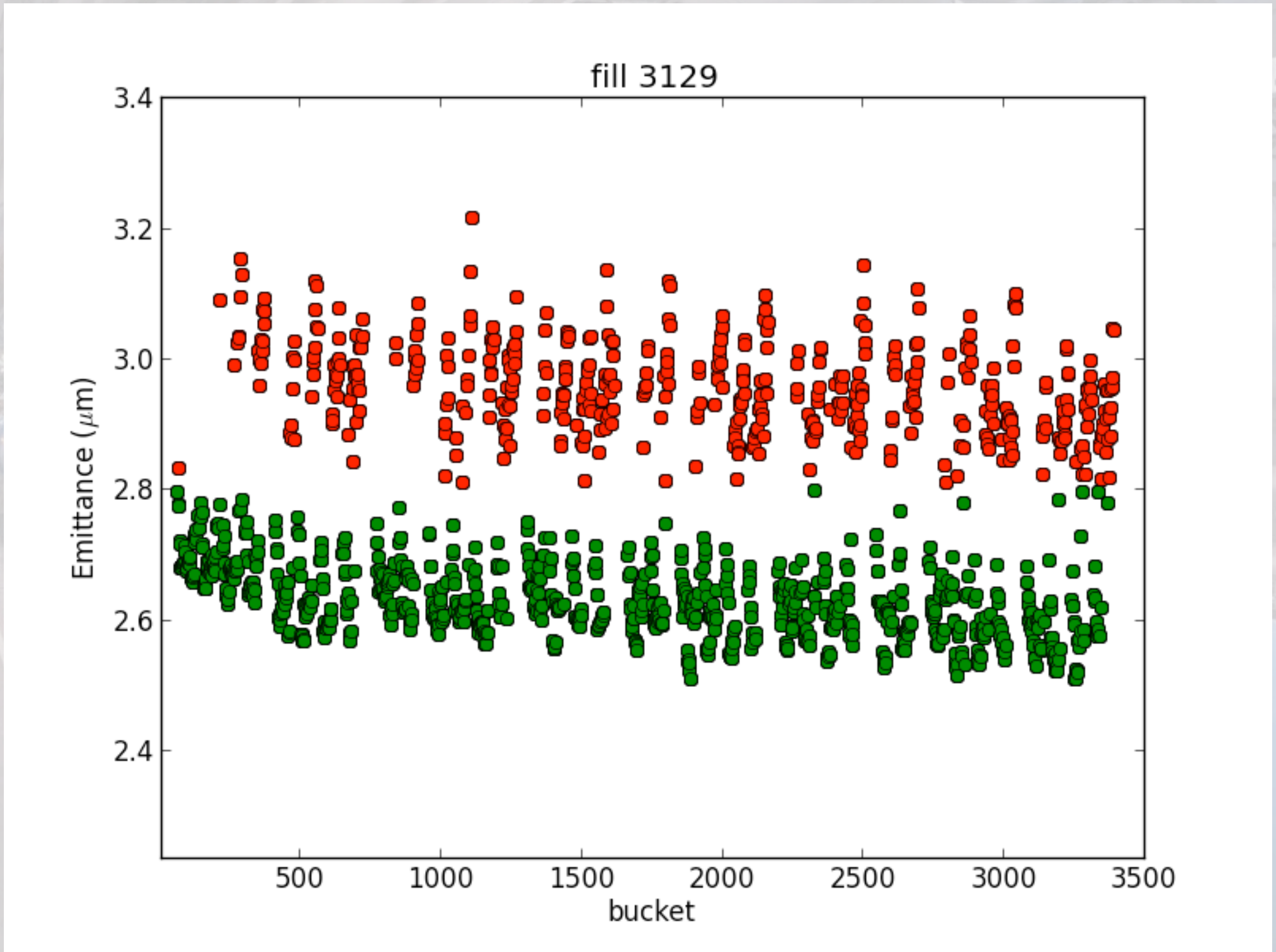
Fits



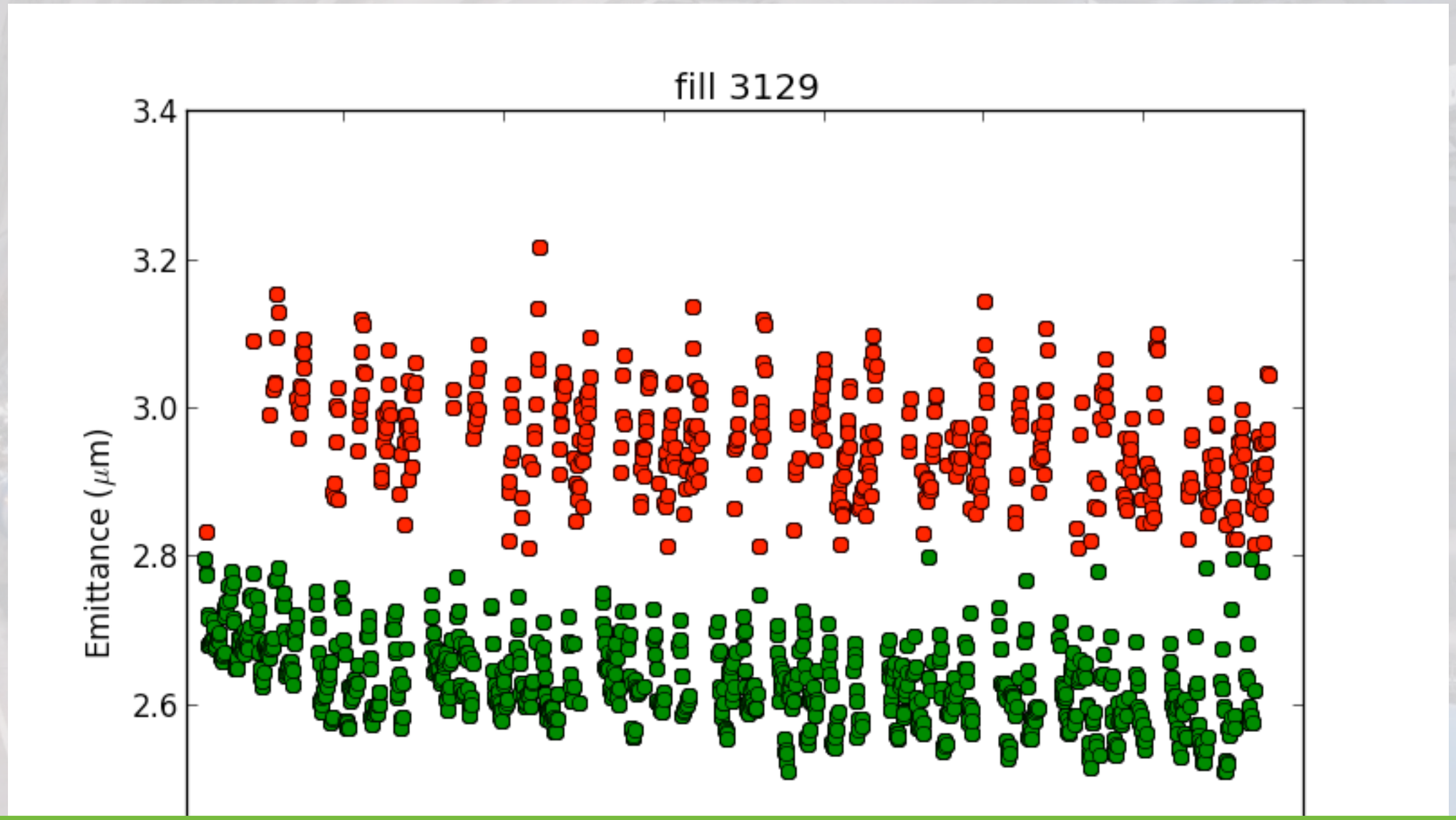
Through an iterative double gaussian fit on the starting distribution (with some normalization and magic trick) I can split in 2 separate distributions



The Good and the Bad



The Good and the Bad



The Good (888)

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The Good and the Bad

The Bad (480)

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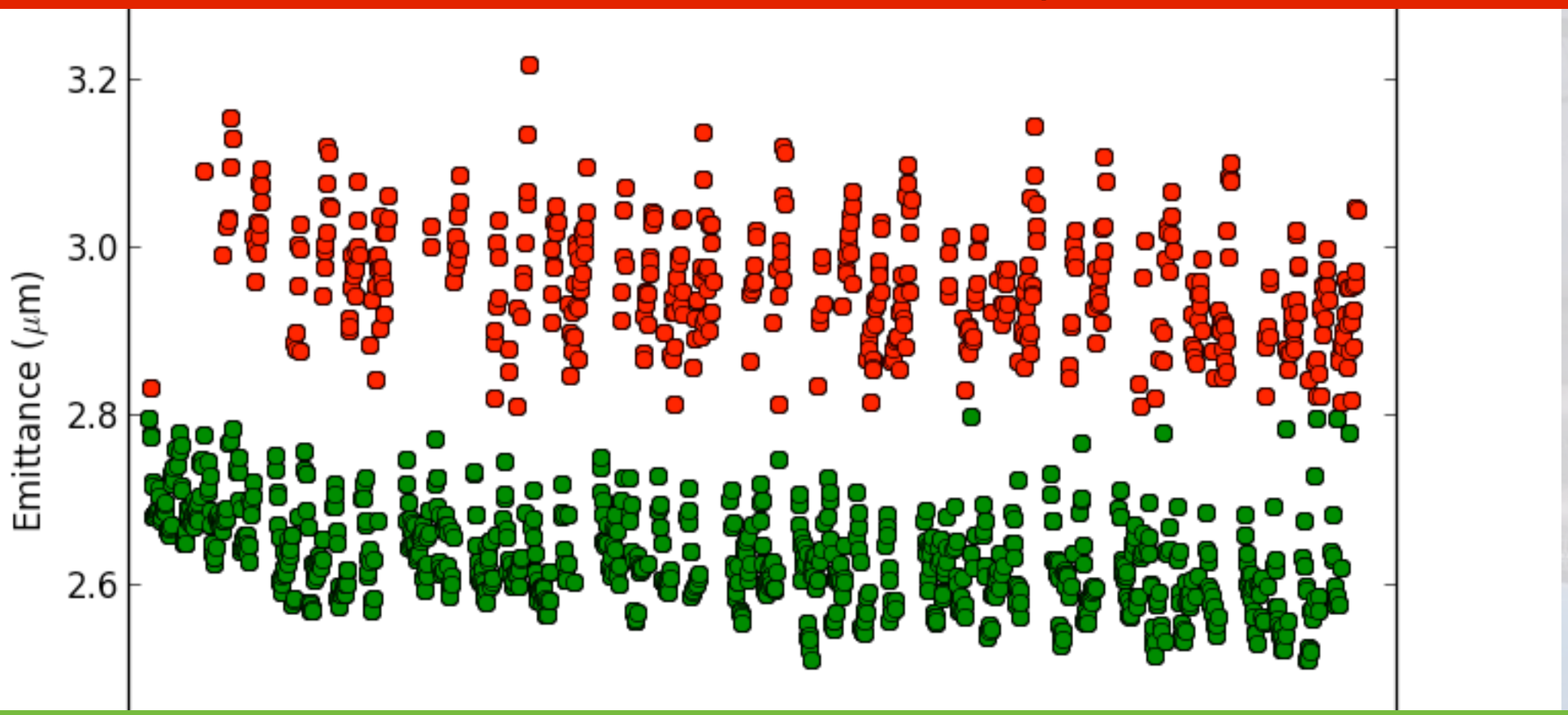

The Good (888)

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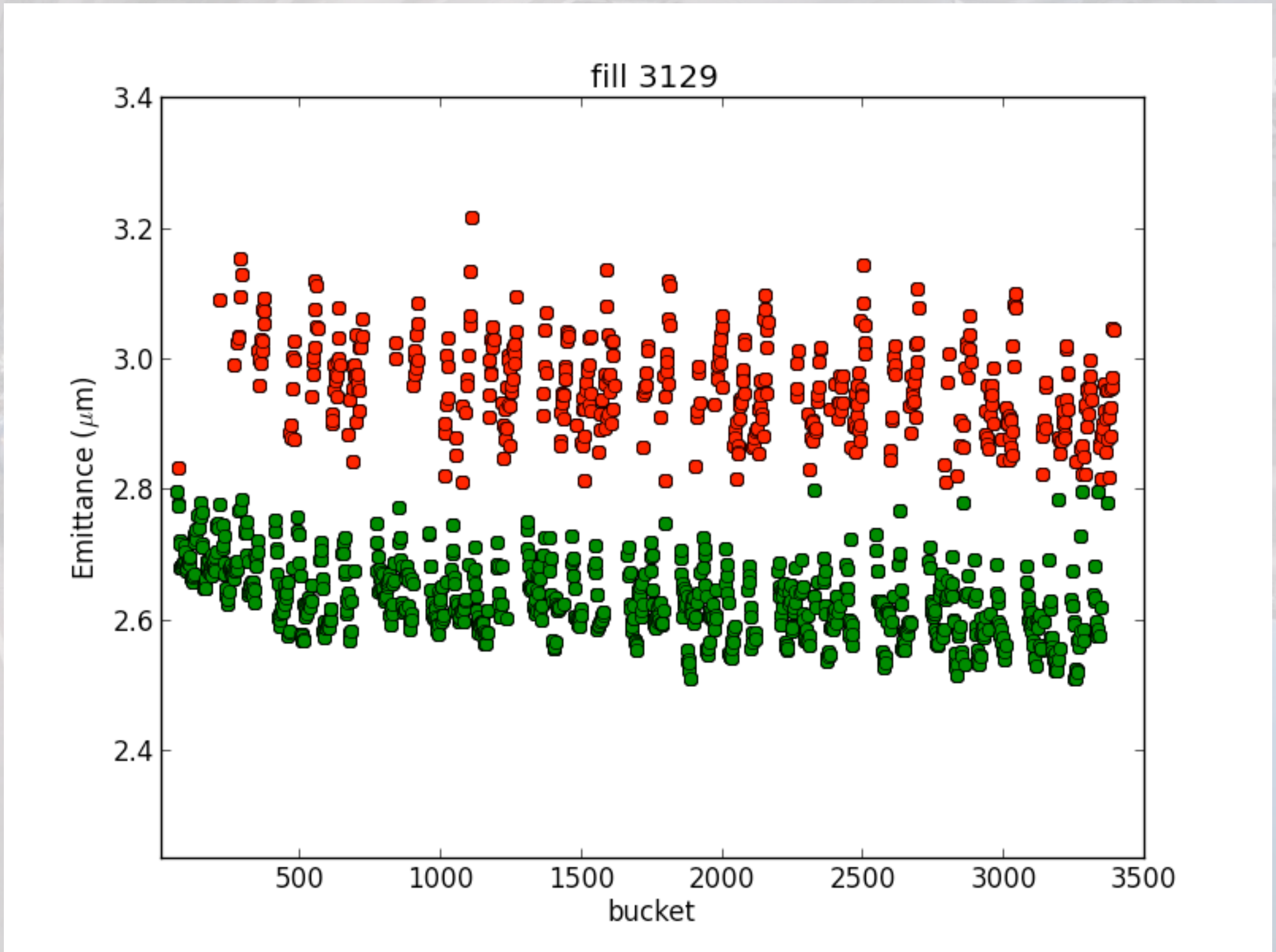
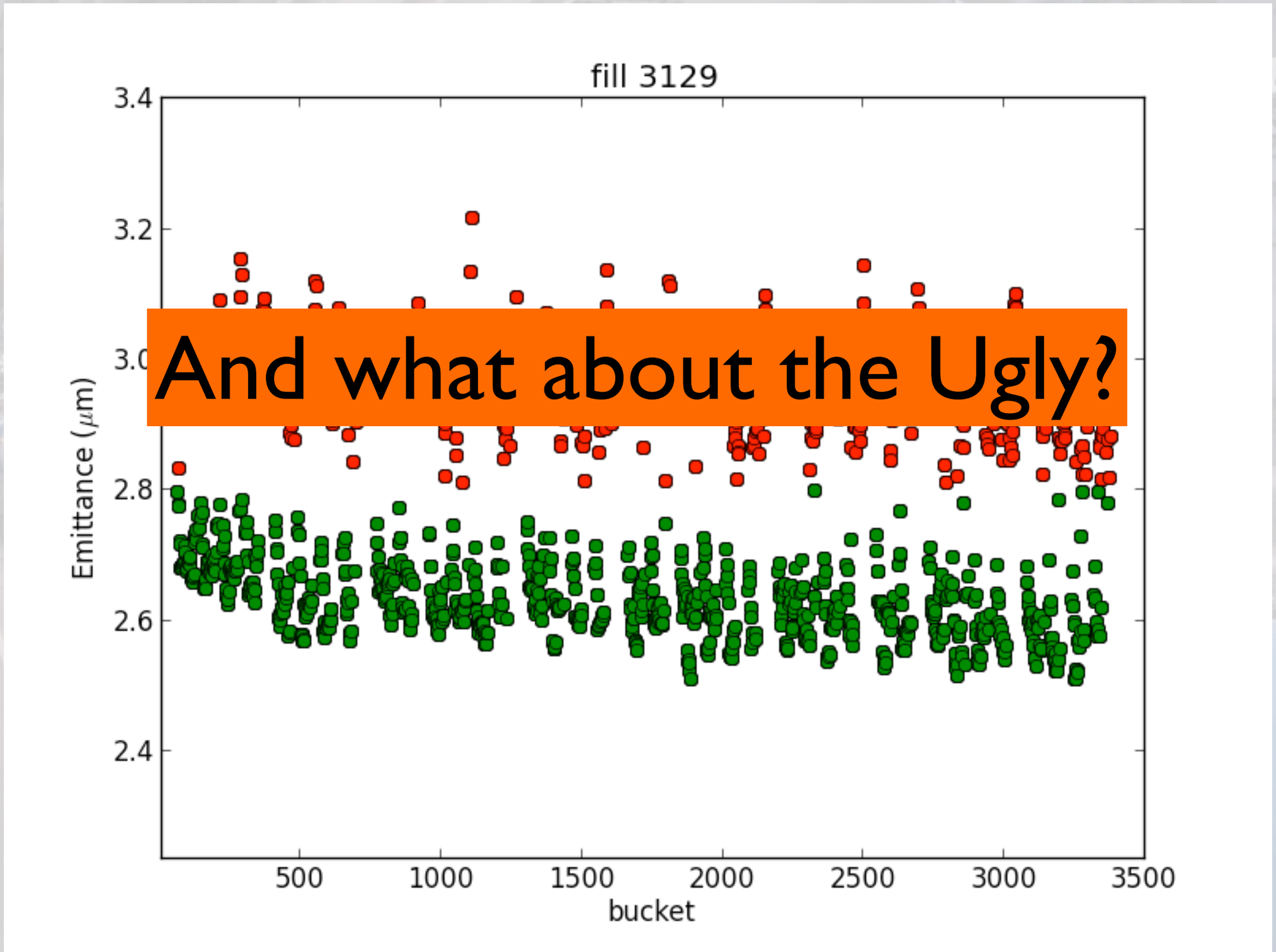
The Good and the Bad

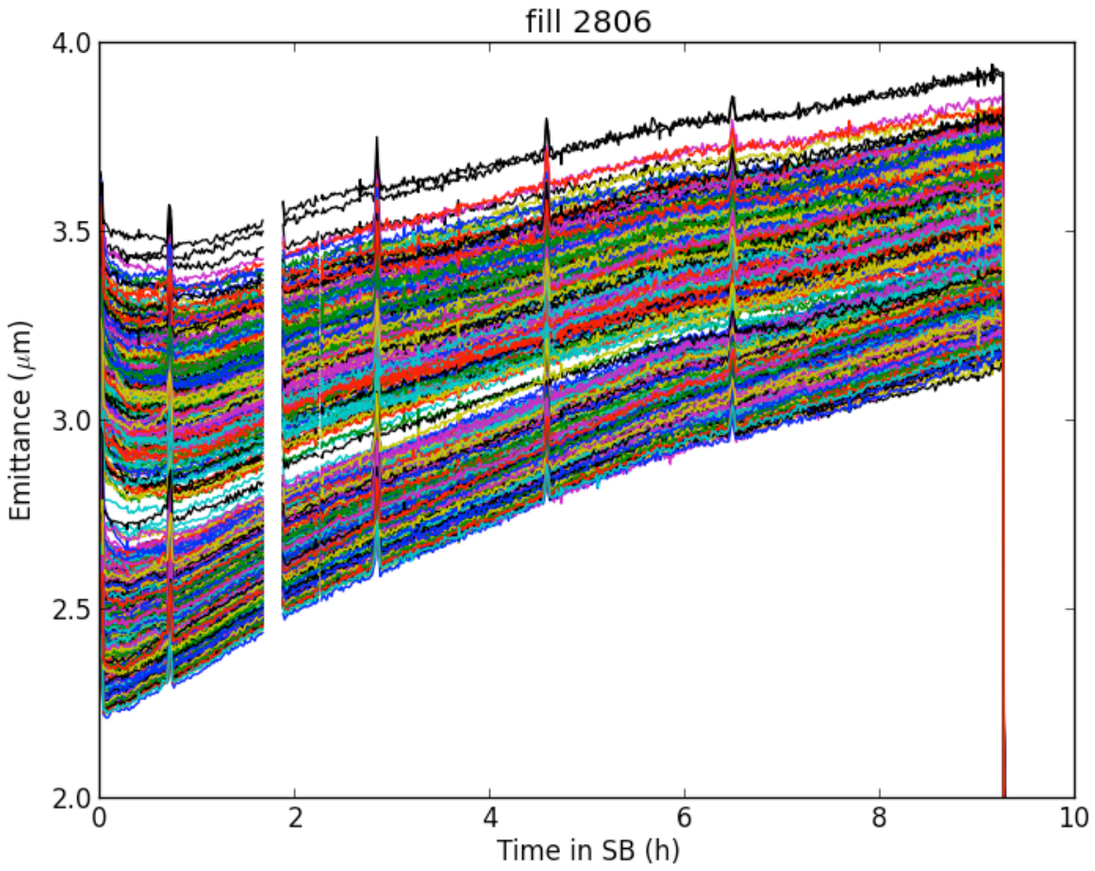


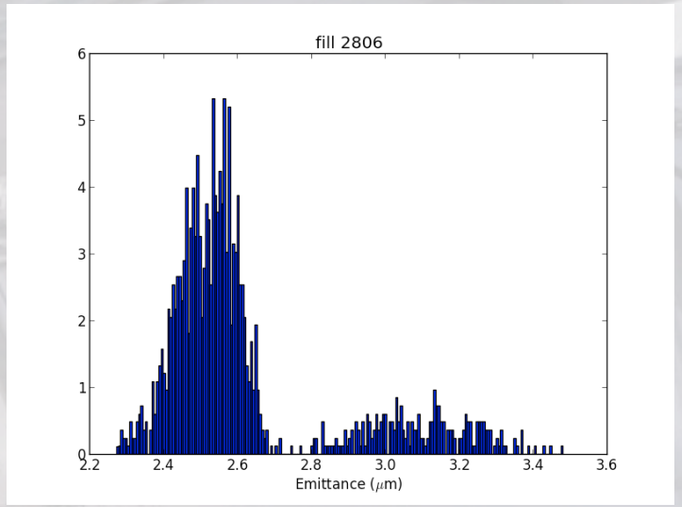
The Good and the Bad



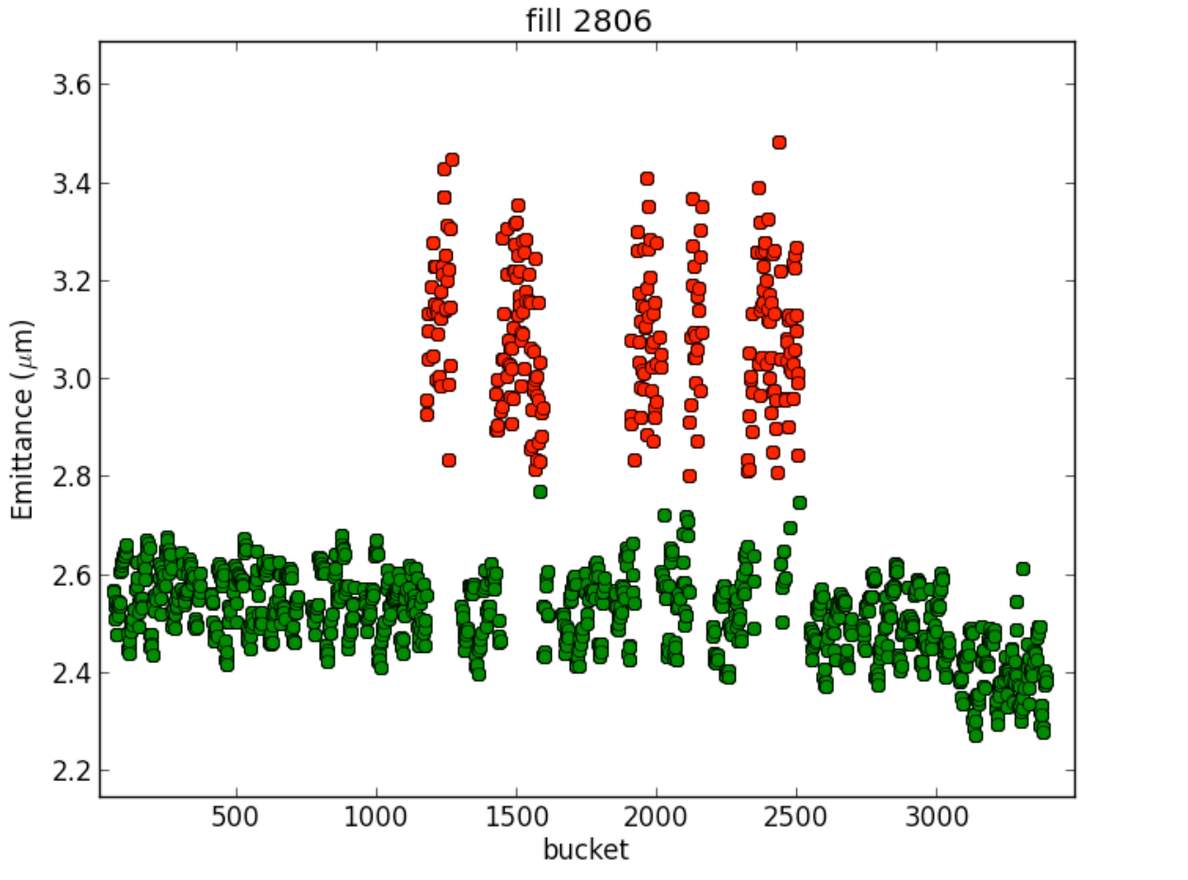
And what about the Ugly?

Ugly case: fill2806

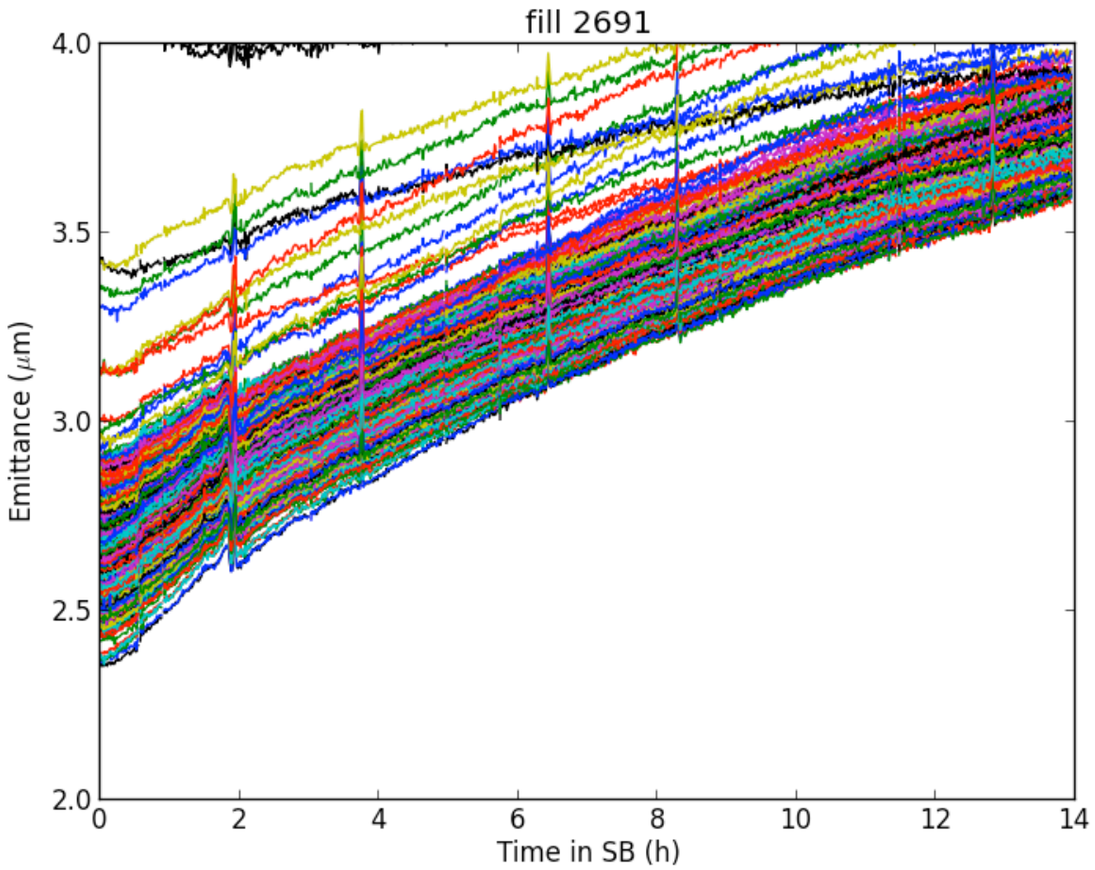


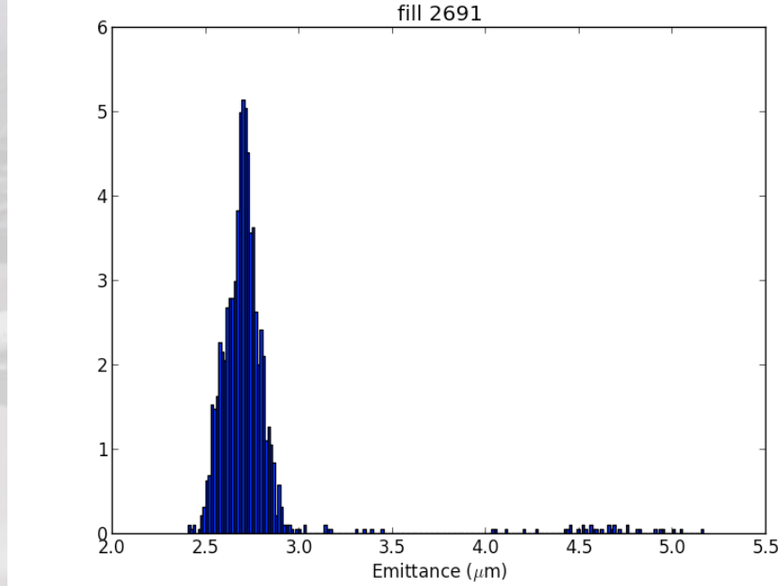


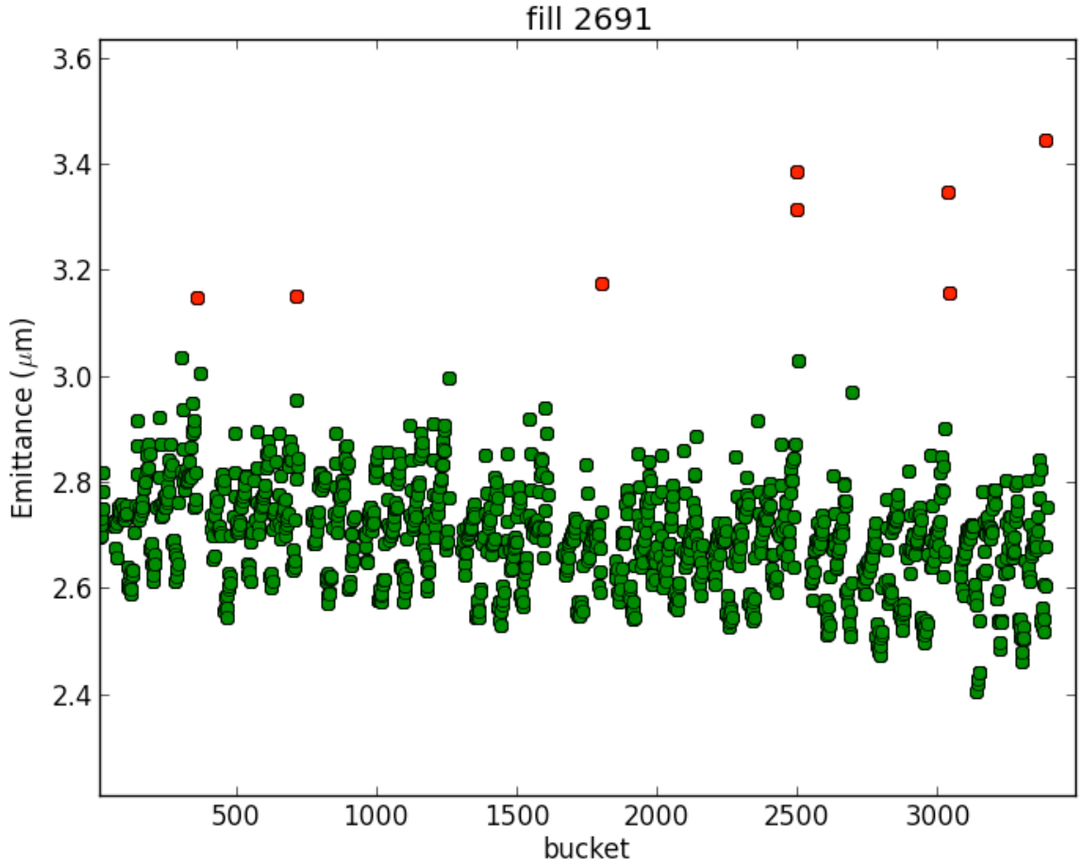
Procedure work also on families with very different populations



Even worse: fill2691







Procedure still spot the few blown-up bunches!

What can I provide?

For every fills (or better for a subset of fills selected by you...analysis take lot of time....):

- Lumi Plots for every fill (eventually from ATLAS/CMS/LHCb/ALICE)
- For plot with weird behaviour:
  - list of good/bad bunch
  - mu/sigma for lumi distribution
- Ongoing: plot vs number of LongRange (no clear correlation spotted yet..)