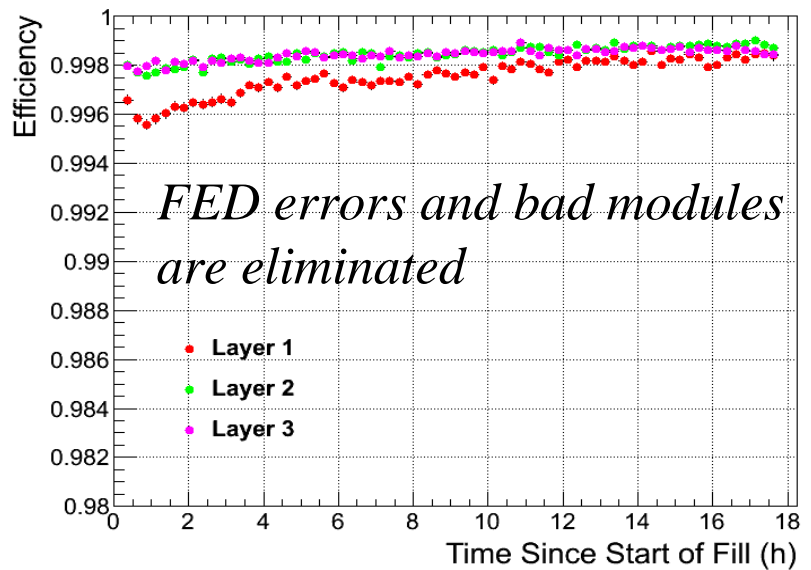
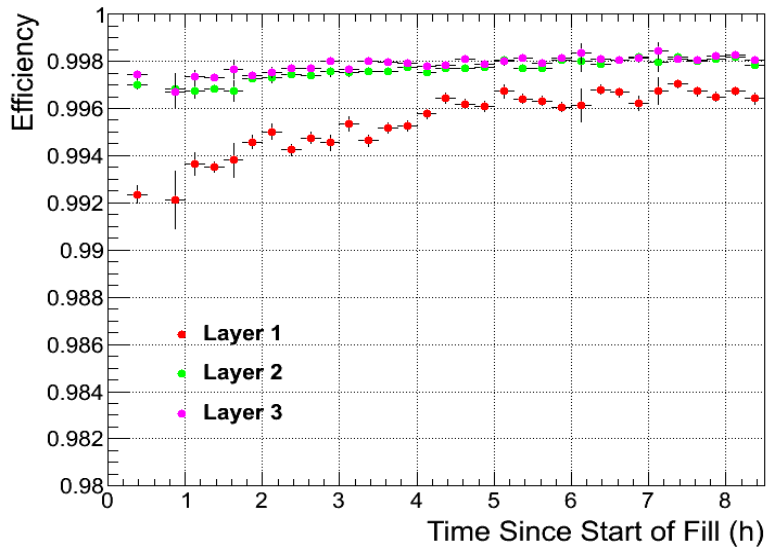
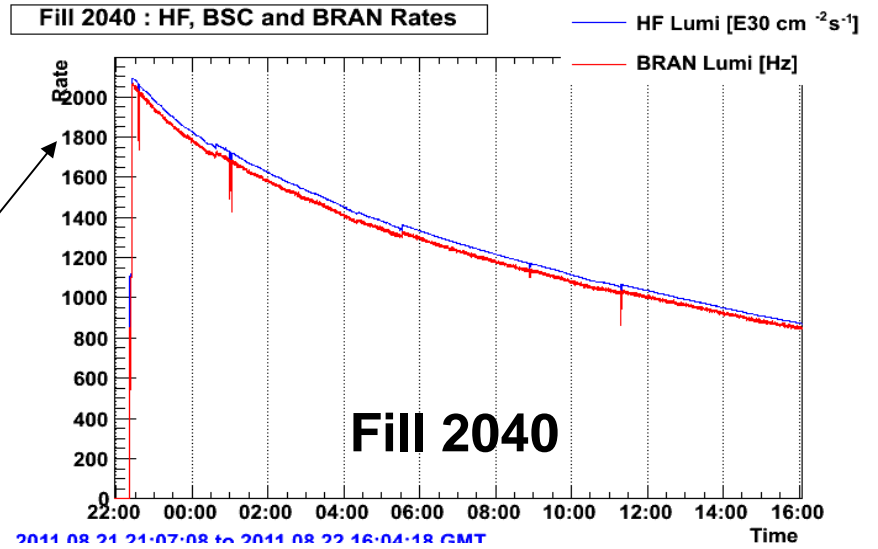
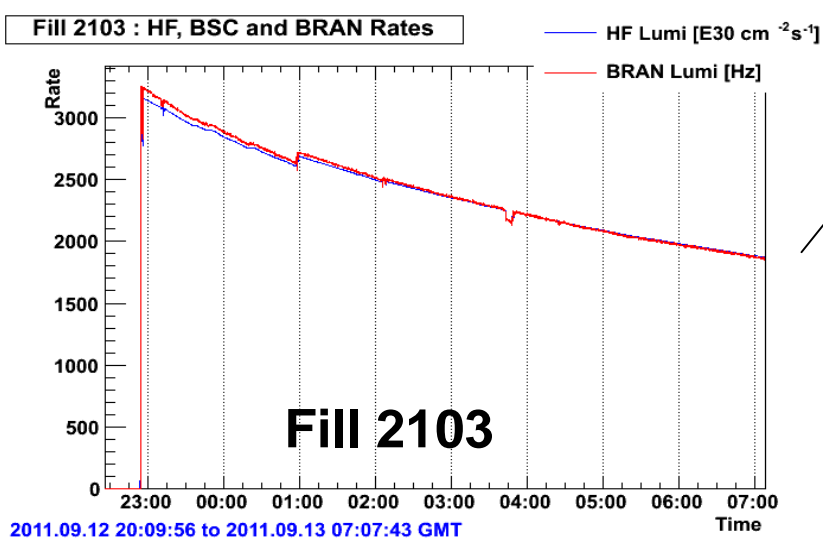


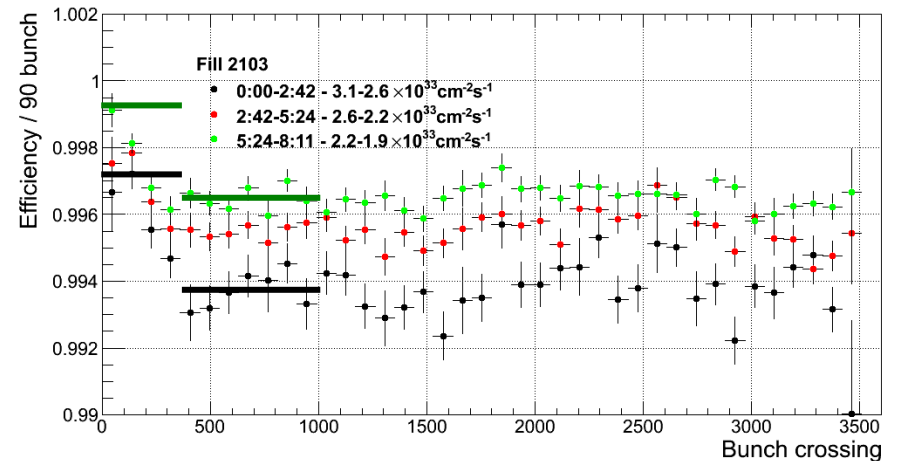
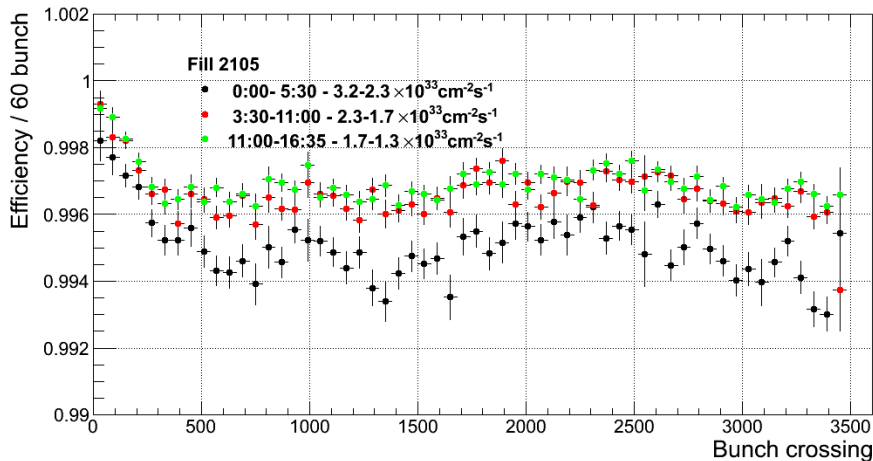
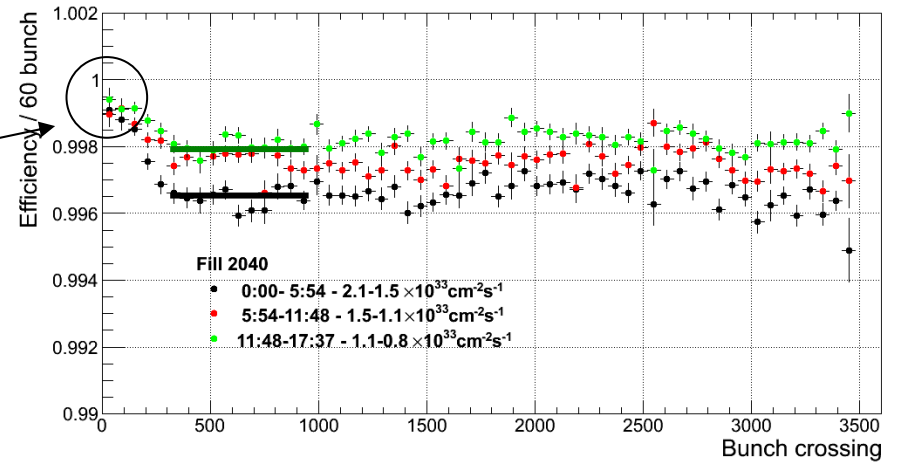
Pixel Dynamic Inefficiency

Pixel Efficiency Trends



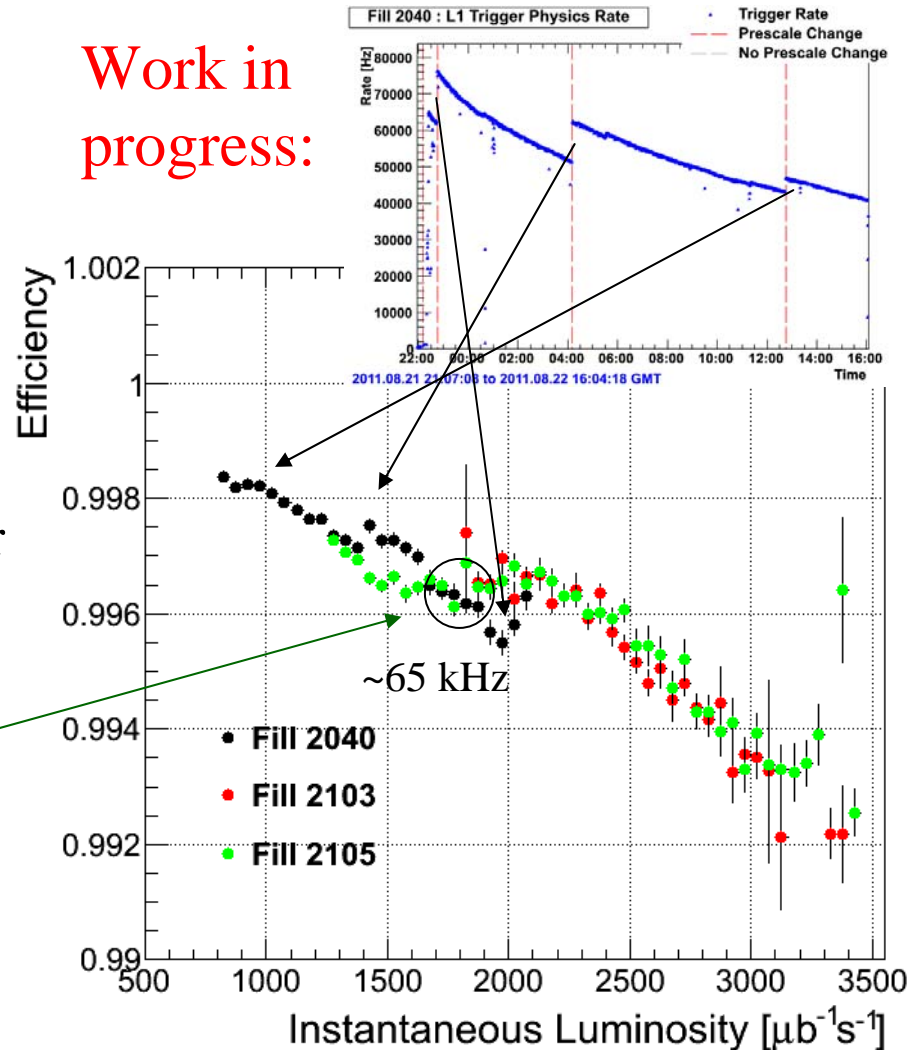
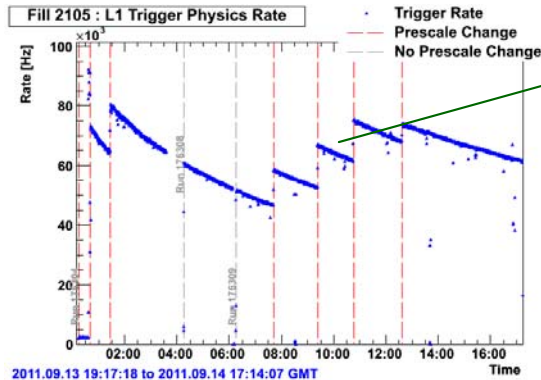
Dynamics Efficiency Loss

- Max efficiency is 99.95%: small systematics in the measurement
- „Low instantaneous lumi”: efficiency loss seems mostly due to buffer filling
- „High instantaneous lumi”: there is also a common offset

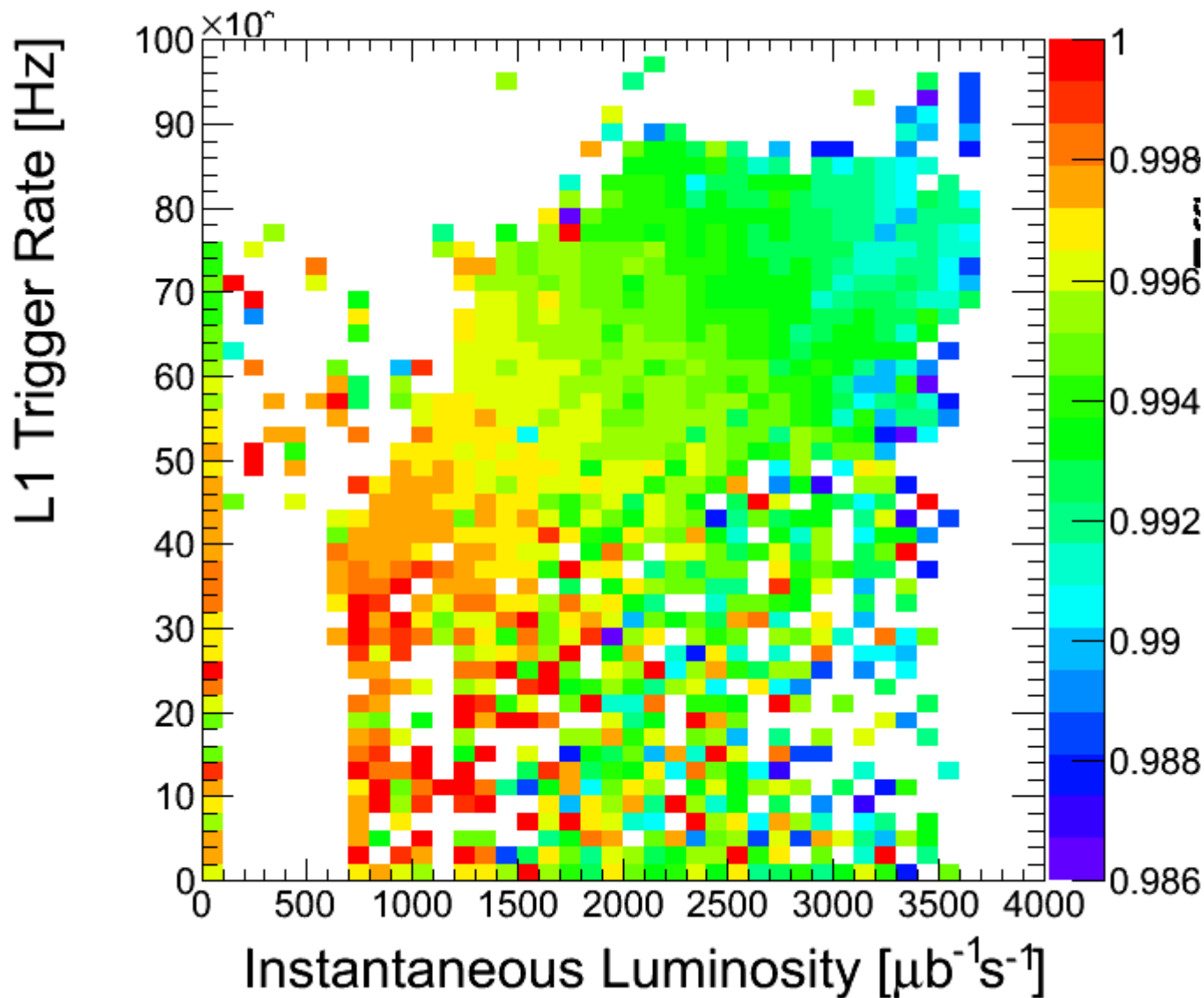


Efficiency Along a Fill

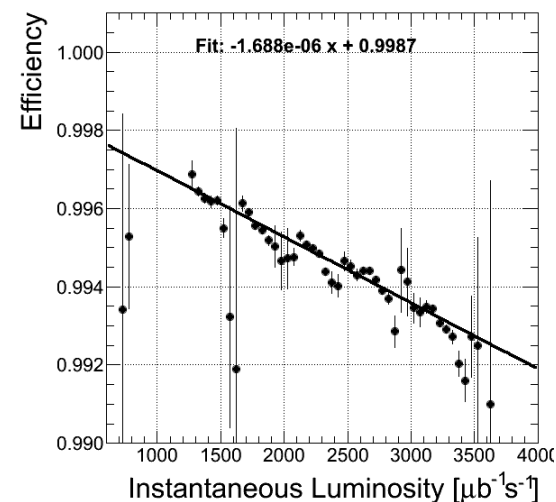
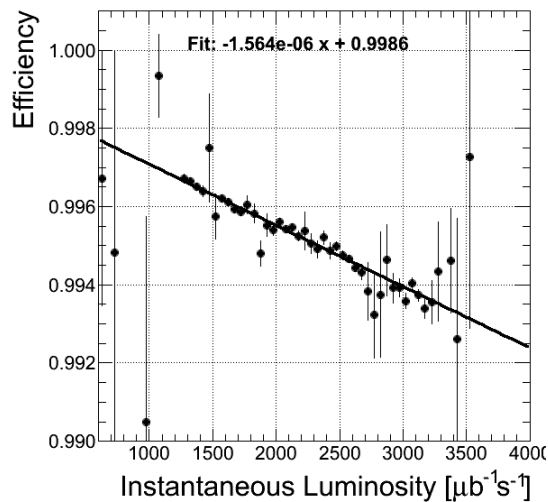
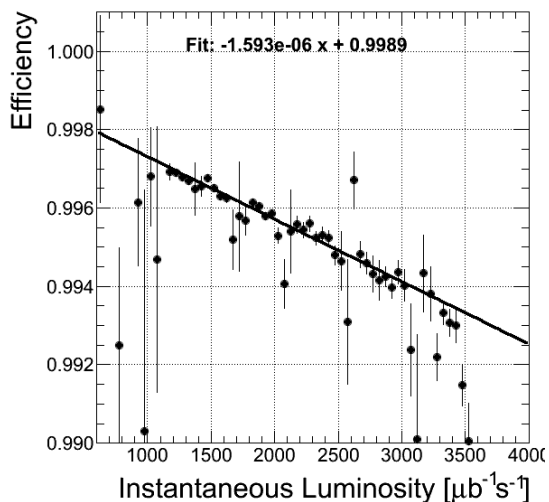
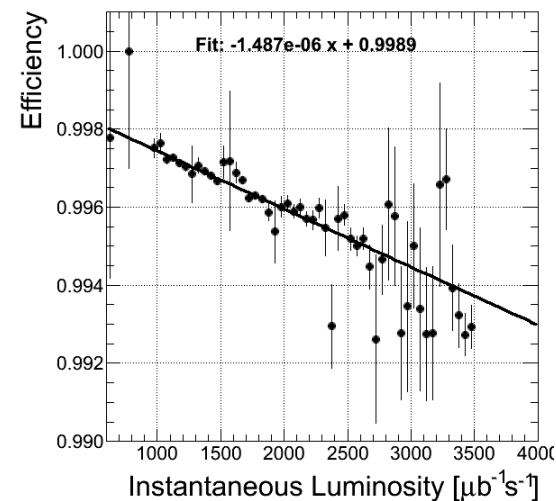
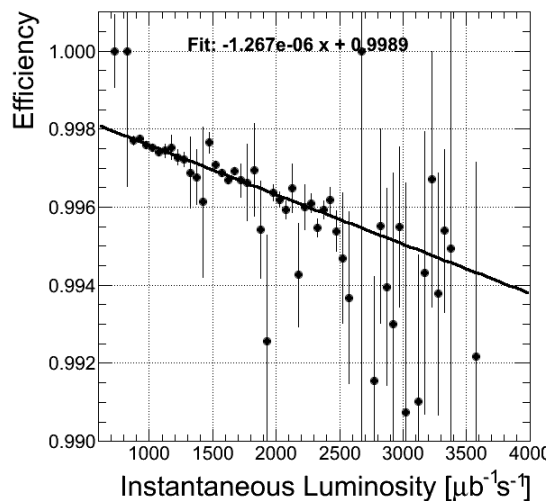
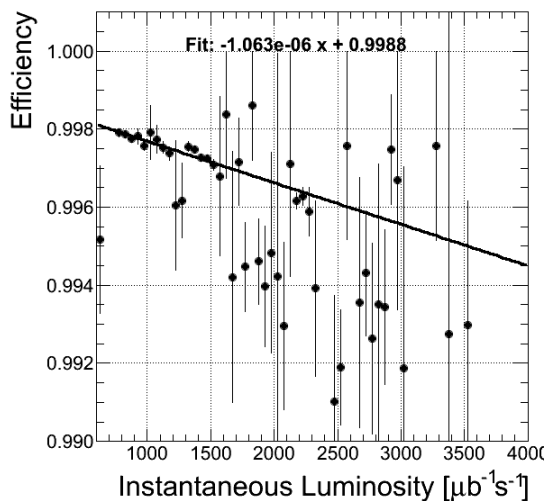
- Efficiency loss can be parametrized by the instantaneous luminosity and read-out (L1 trigger) rate
- FED errors and bad modules / ROCs are excluded
- Efficiency on Layer 2 and 3 is better than 99.6% so far



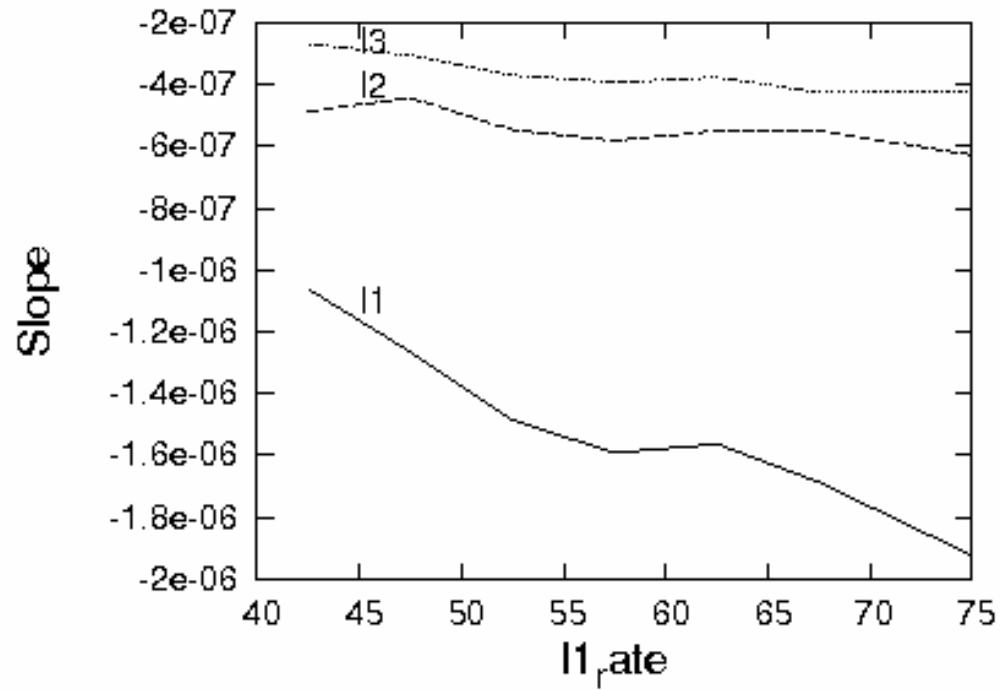
Eff vs Inst Lumi vs L1 rate



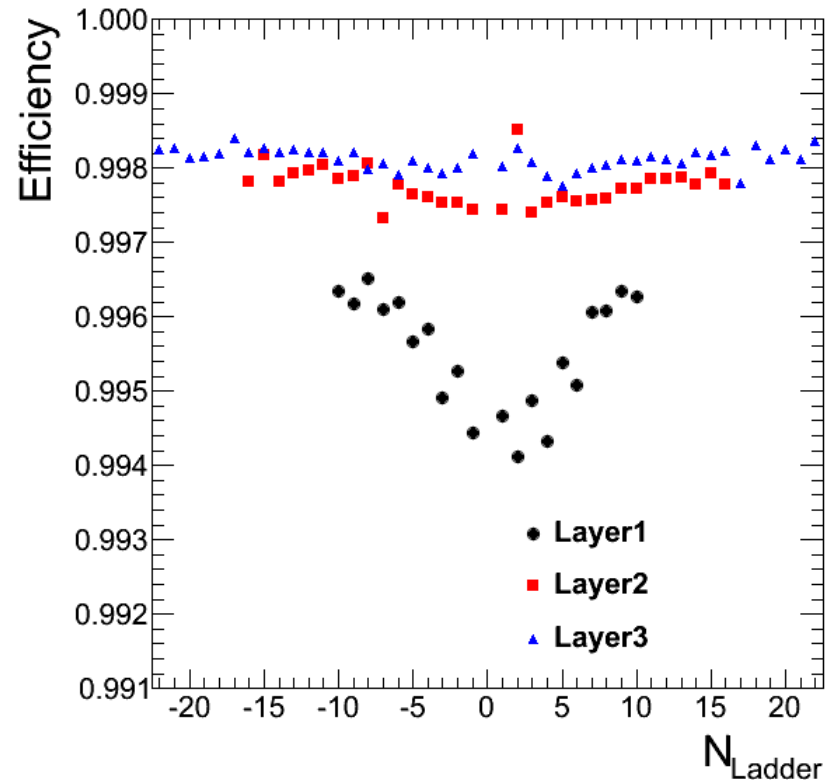
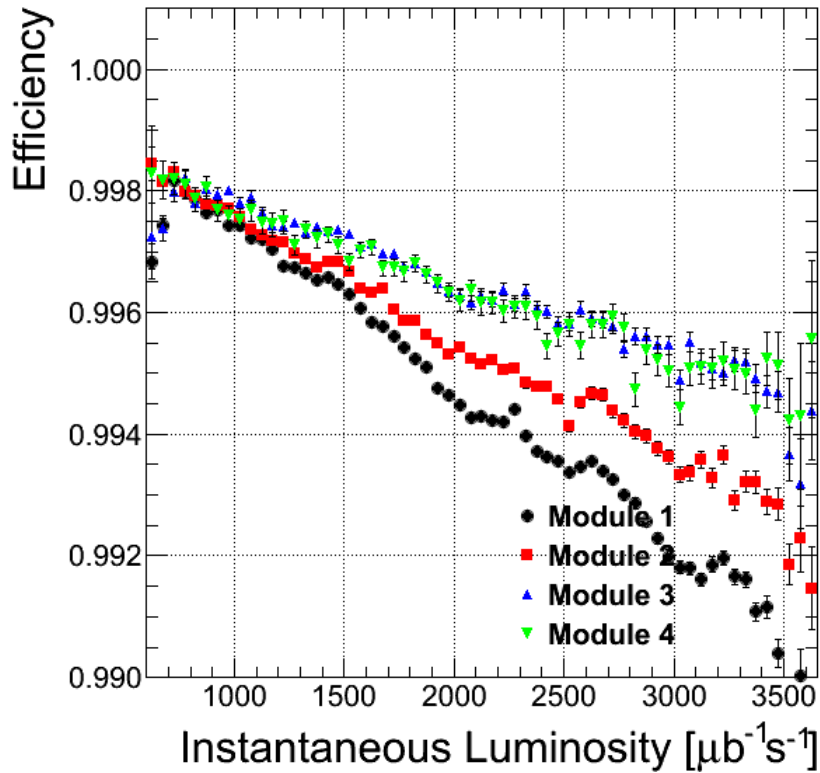
Efficiency in L1 rate bins



Parametrization of L1 rate bins

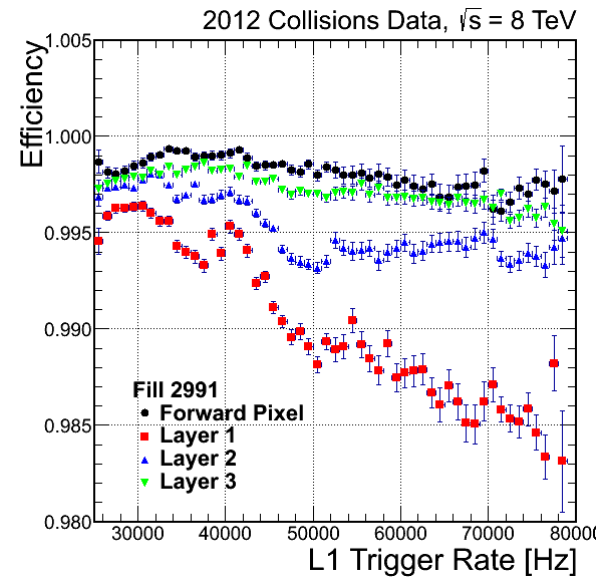
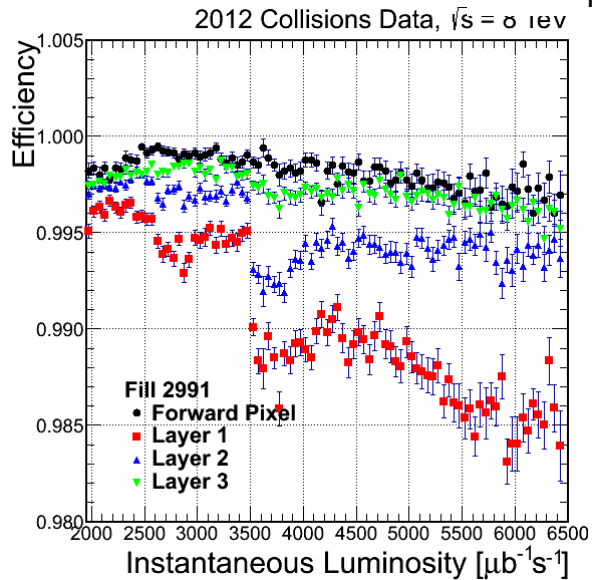
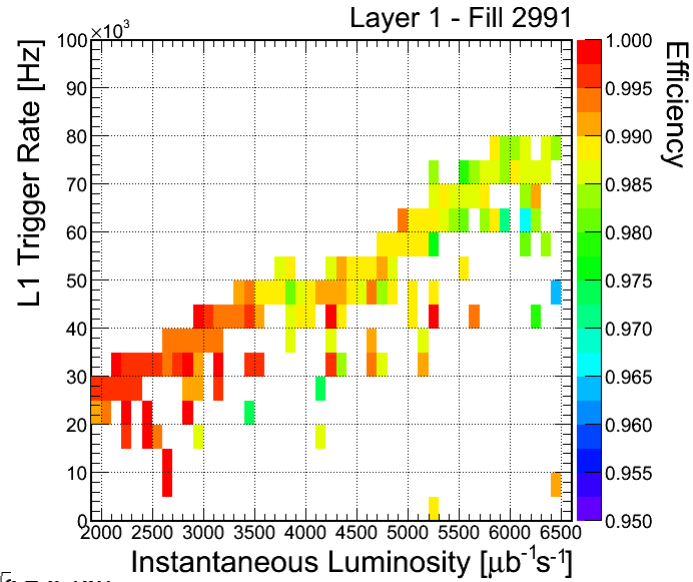


Geometric dependence of efficiency



The efficiency also depends on ‘eta’
Signs of the beam off-set

Update on 2012 data



Next steps

- We need to redo parametrization on 2012 data and update results, so we need ntuples (Alberto)
- We need to consolidate results and pick most significant variables (Viktor and Janos)
 - Inst lumi
 - Num of vertices
 - L1 trigger rate (in bins)
 - Geometric dependence: modules, ladders
 - BX dependence
- Need to insert parametrization in simulation modules (Viktor)
- Need simulation that approximates data in the desired parameters as much as possible
 - Generate MC (Silvia)
 - Data/MC comparison plots (Silvia?)
 - Make ntuples for efficiency calculation (Alberto)
 - Testing simulation modules on MC – will require multiple running (Silvia, Alberto?)

Scheduling

- Step 1 (get the data)
 - Alberto starts making ntuples from data
 - Janos prepares plots to run on ntuples
 - Viktor tries to understand the code of the simulation guys
 - Silvia generates more simulation with large statistics
- Step 2 (determine optimal parametrization)
 - Janos and Alberto remakes plots, we decide how to parametrize efficiency loss
 - We scale the efficiency with these parameters and make Data-MC comparison plots
 - In case of disagreement, reiterate on simulation of relevant parameters
- Step 3 (the actual implementation)
 - Viktor implements parametrization in MC
 - Silvia regenerates MC with new modules
 - Alberto and Janos remake ntuples and plots