

AG CLEANING

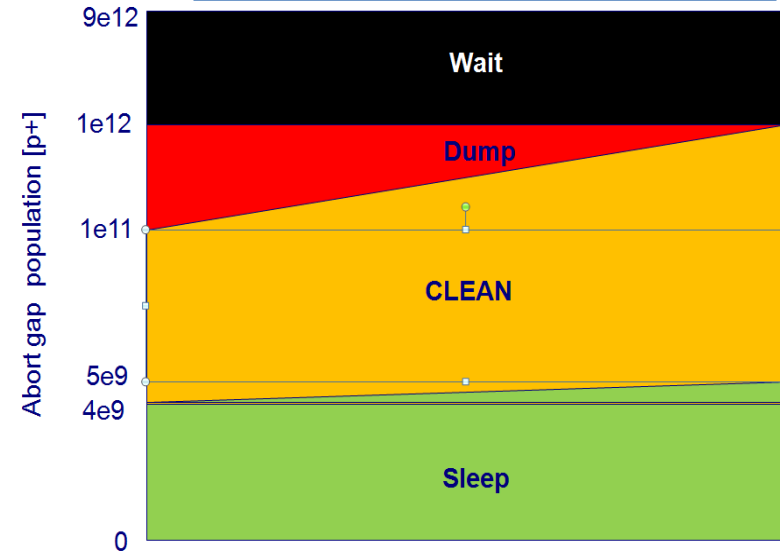
W. Bartmann, M. Fraser, J. Uythoven

MPP meeting, 13th May 2016

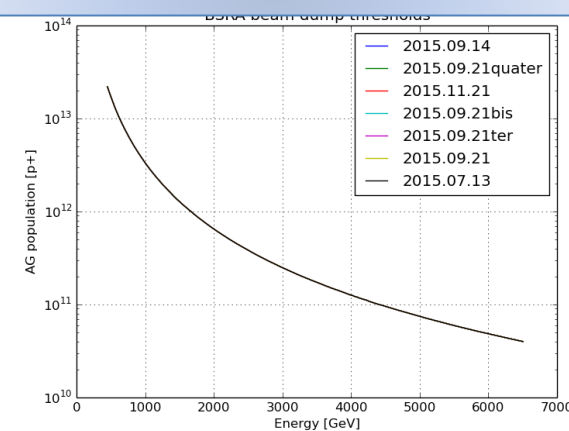
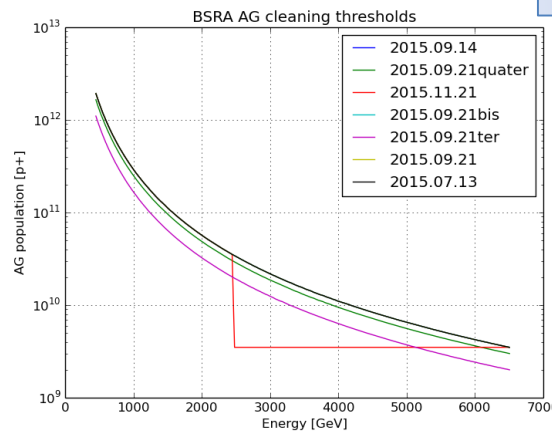
Cleaning procedure 2015

- Clean continuously at injection energy
 - Known effect on luminosity at flattop
 - Worth to test in MD if also detrimental at flat bottom?
- No cleaning during ramp
- At flattop:
 - Automatic cleaning above 3.5×10^9
 - Dump at 4×10^{10} (masked)

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S. Mazzone, MPP 18/03/16



Rational behind procedure

- [EDMS](#), AG cleaning for Run 2
- FLUKA simulations for 6.5 TeV at Q4 and Q5 and Q5
- Electro-thermal calculations to determine quench and damage levels
- Cleaning to start at 10% of lowest quench level – about a pilot in the AG
- Experience with this level also at 4 TeV in Run 1
- A dump with fully filled AG or asynchronous with AG is not expected to cause damage

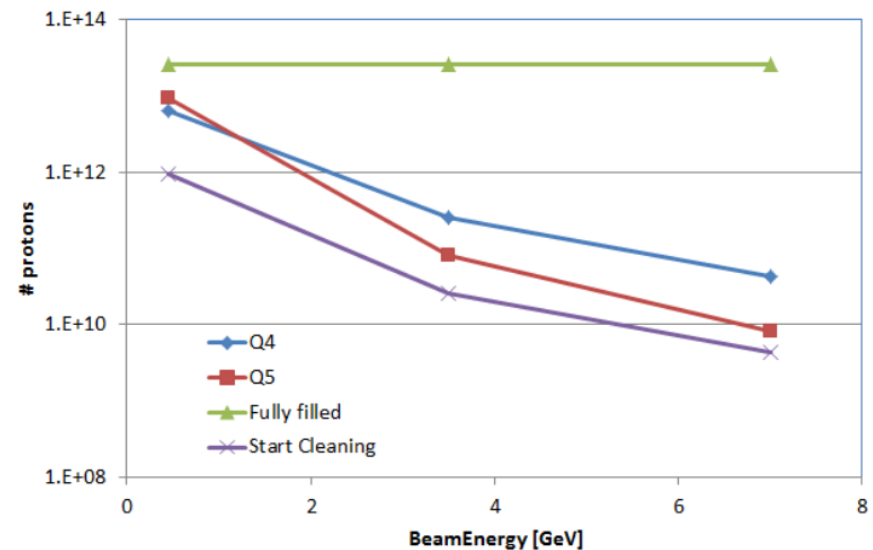


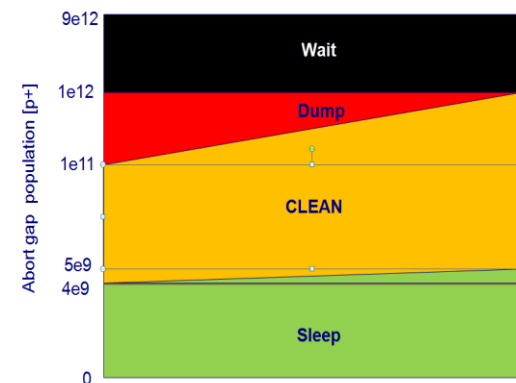
Figure 2: Quench levels and abort gap cleaning levels

AG monitoring/cleaning in operation

- Signal from AG monitor, in particular at 6.5 TeV
 - Very clean and reproducible
 - Sensitivity well below required few $1e9$ at flattop
- AG cleaning can be precisely adjusted
 - Can clean single AG bins (100 ns)

Possible updates

- Threshold curves OK – need only 6.5 TeV value
- Splitting AG technically feasible but overcomplicates procedure
 - will leave this rather to analysis of asynchronous beam dump tests
- “Wait” area – question is what shall improve
 - Coming into this area:
 - Most probably RF system is not in nominal situation
 - Cleaning had failed or cannot compensate AG population increase
 - Dump request announced by Big Sister not executed
 - Operator to assess situation and most likely dump

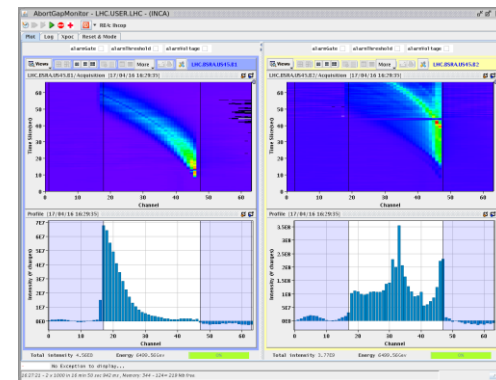
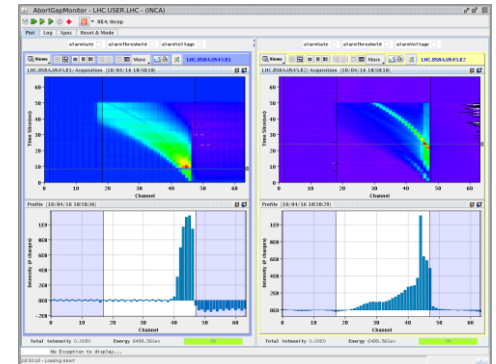


Cleaning and beam dump flag 2016



Cleaning and beam dump flag 2016

- Cleaning events in 2016
 - 10/04, 18:48: Asynch dump test
 - 17/04, 16:49: Asynch dump without usual bump
 - 18/04, 18:11: Asynch dump end of squeeze
 - 21/04, 08:48: asynchronous dump at end of squeeze after TOTEM bump with 1 reduced nominal ($\sim 5e10$) + 1 probe per beam
- Dump events
 - 14/04, 23:27, Asynch dump at flattop
 - 22/04, 07:17, Asynch dump in collisions
 - 10/05, 18:29, Asynch dump in collisions after BTVD out



Cleaning and dump flag

- In 2016 none was raised in stable beams
 - Sequencer issue might distort this?
- From last year experience
 - Cleaning raised about once per month
 - Dump none
- Proposal to keep dump flag masked and monitor over longer stable beams period

Conclusions

- Present procedure appropriate for 2016 beam conditions together with AG monitoring and AG cleaning capabilities
 - “Wait” → “Investigate what’s wrong”
- Keep mask on beam dump flag and monitor its frequency