



MD2202: LR beam-beam compensation

Y. Papaphilippou, A. Rossi and G. Sterbini on behalf of the large MD team

MD2202: LRBB compensation

- **Requested time:** 8 h
- **MD Merit:** The goal of the MD is to compensate or mitigate the BBLR effect by using DC wires (see Wire Experiment for Long Range Beam-Beam compensation workshop <https://indico.cern.ch/event/615088/>).
During the MD1 block (FILL5900) **the positive effect of the BBCW was observed**. We are now going to explore in a systematic way the parameter space, namely the compensation efficiency with respect to the wire current (lengthy measurement).
- Detailed programme will be prepared after measurements in MD#3 (17 October)

MD2202 Summary

Bunch intensity (10e11 ppb) : >1.2 (BCMS, quite intense bunches)

Number of bunches: B1: 1x48+ LHCINDIV (matching the train characteristic) ; B2: <3e11 p in total (2 x LHCINDIV, matching B1 train characteristic)

Transverse emittance (μm): Nominal BCMS

Bunch length (4σ , ns): Nominal BCMS

Short description: After having put the beam in collision at top energy using the standard procedures, the TCL.4L5 and the TCTPH.4R5 will be approached to the B2 ($I_{B2} < 3e11$). A current scan will be performed. During the scan the main observables will be lifetimes derived from FBCT and dBLM, beam intensities and transverse profile evolutions. The B2 bunches will be blow-up to test the compensation in different beam emittance regime.

Optics: squeezed ATS optics at (.31,.32), strong octupoles to stabilize the B1 missing-HO bunches and increase diffusion.

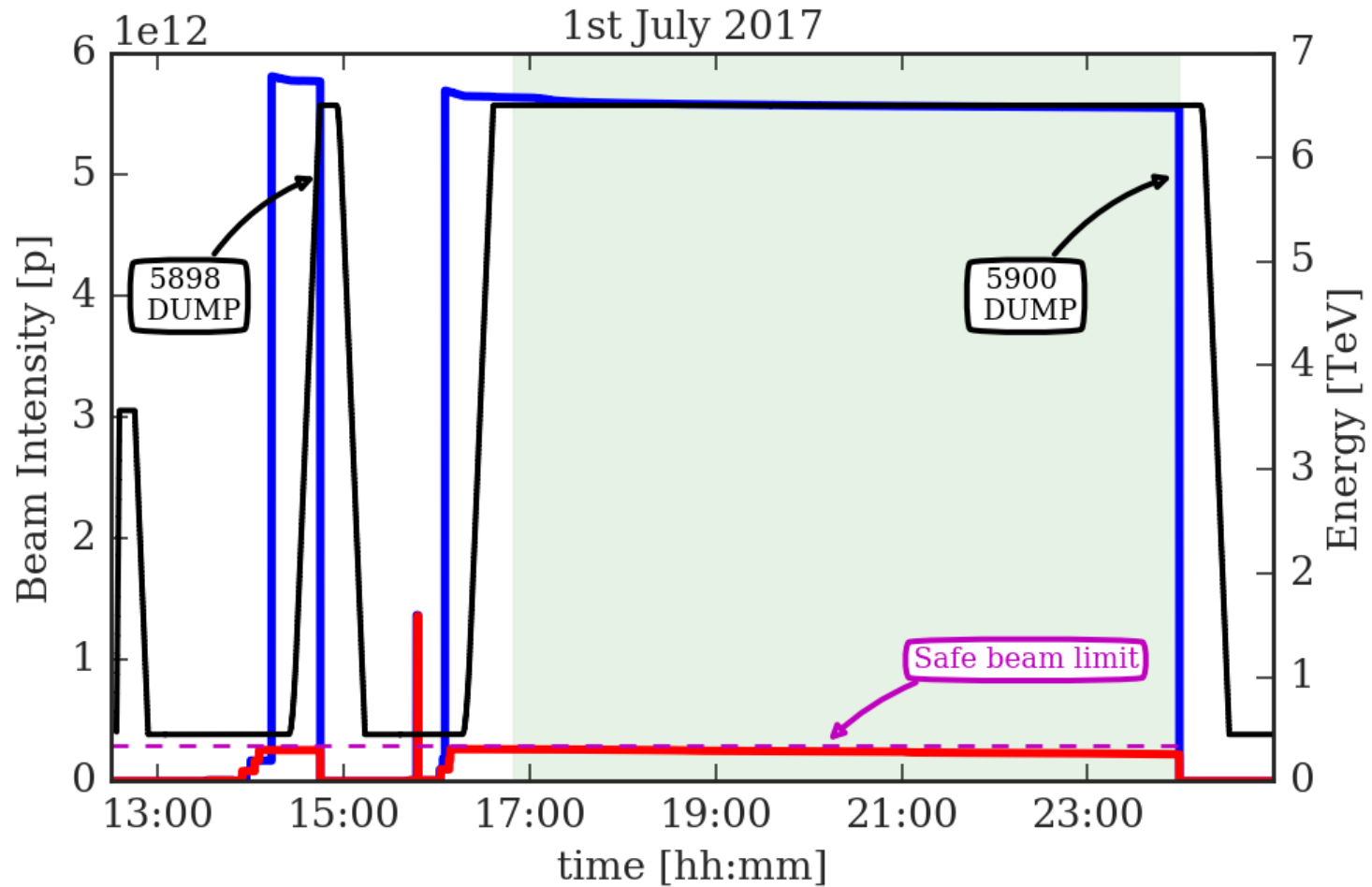
Orbit change: Yes.

Collimation change: Yes.

Feedback change: Yes. BU to test different beam emittance regime.

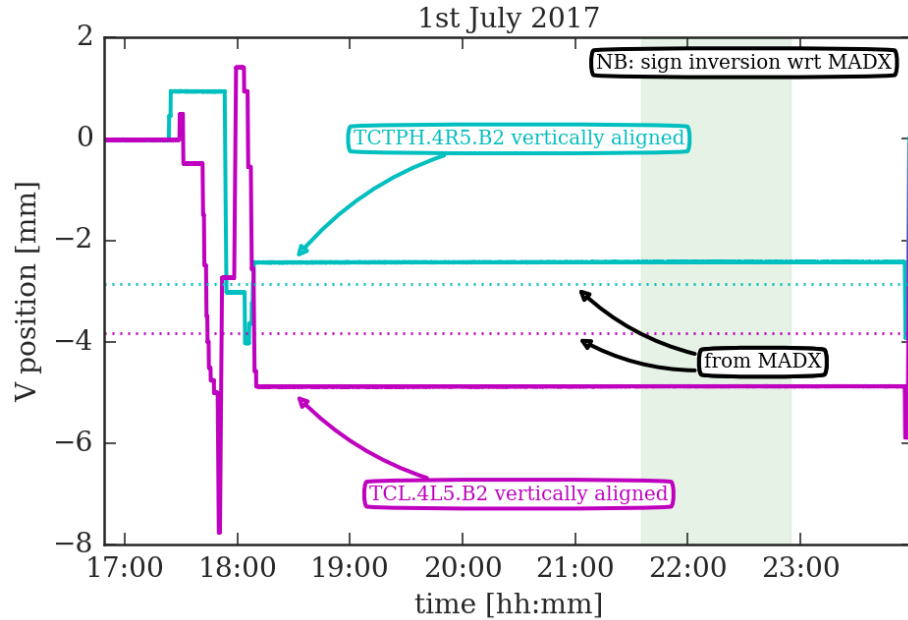
What else should be changed? We need to power the wire compensators and mask their interlocks. We need to approach the jaws of the TCL.4L5 and TCTPH.4R5 up to $6 \sigma_{\text{coll}}$ (TCP set at $5 \sigma_{\text{coll}}$ and TCSP of IR6 closed accordingly).

MD2202, 1st July 2017



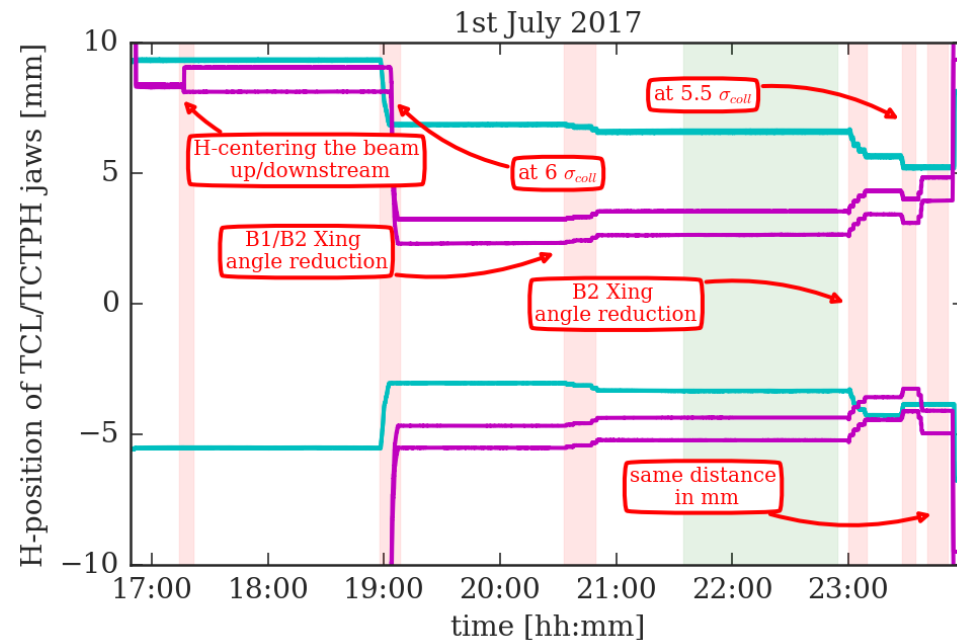
Why we need time and your support (I)

Thanks to the
collimation team
support



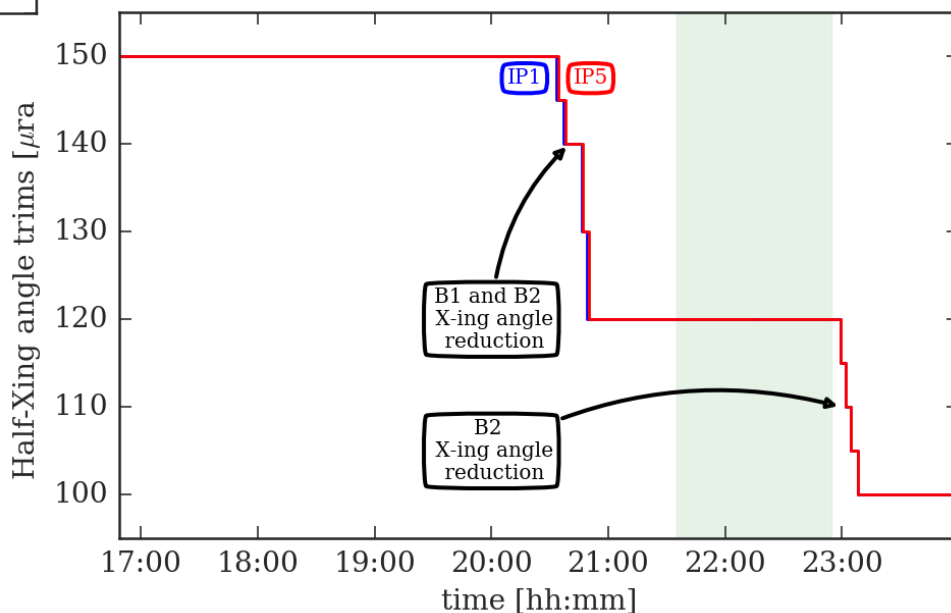
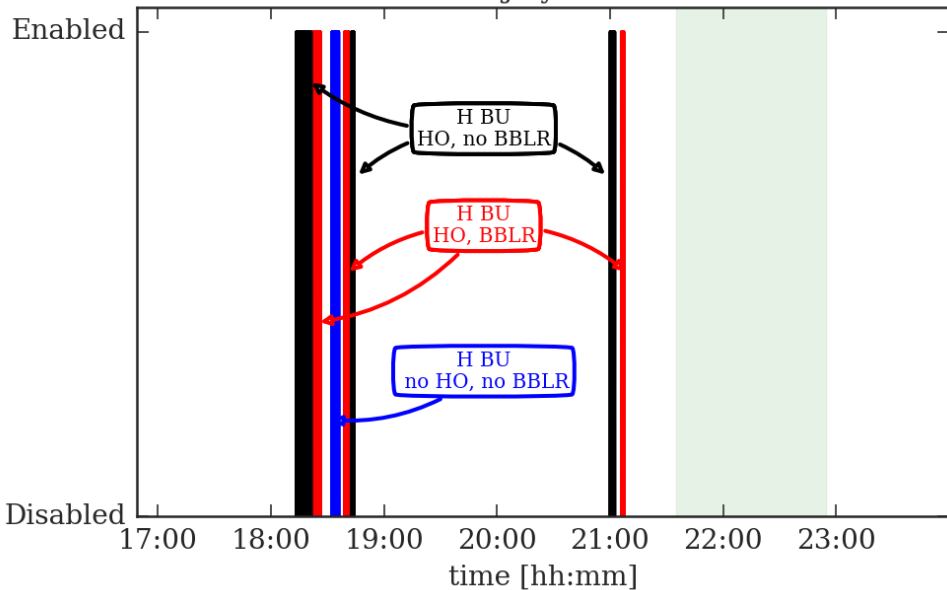
Vertical alignment of the wires

Complex collimators
manipulation

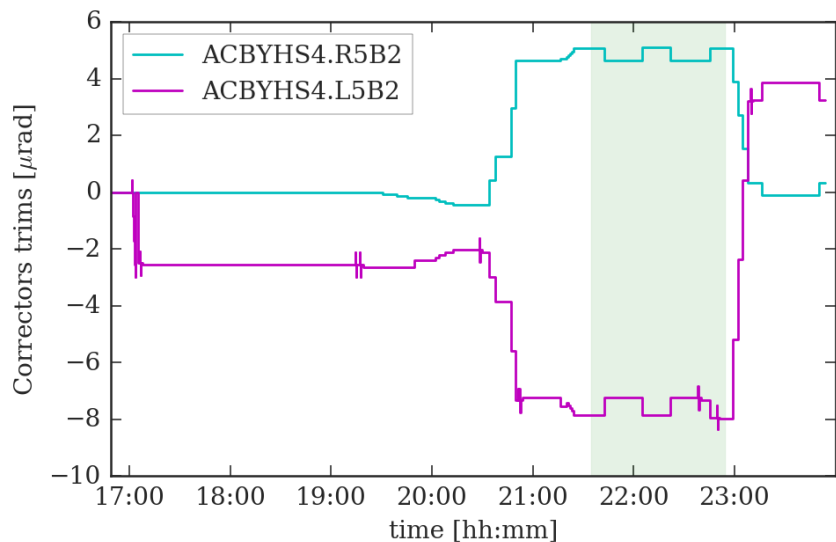


Why we need time and your support (II)

1st July 2017



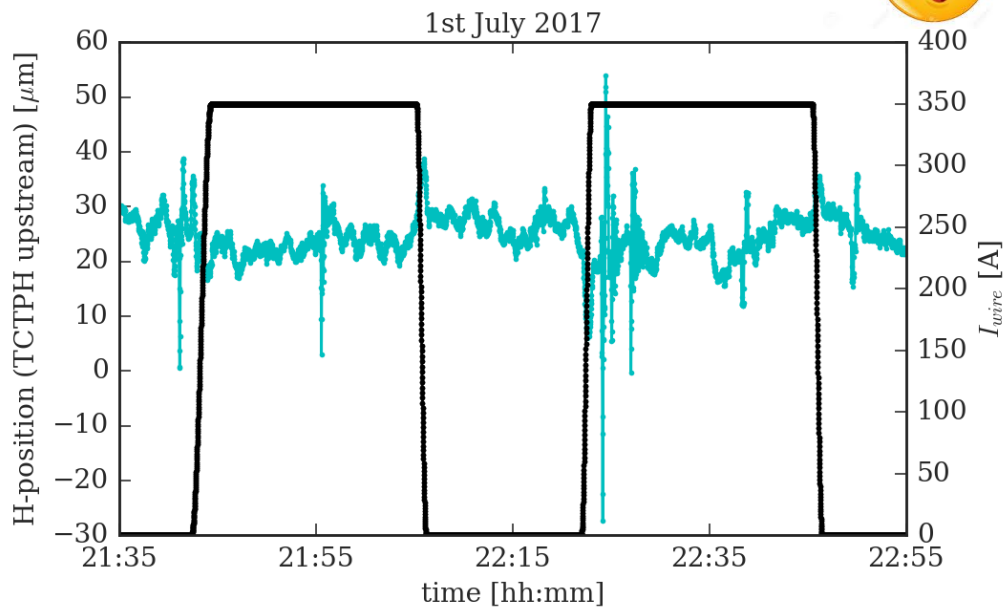
Why we need time and your support (III)



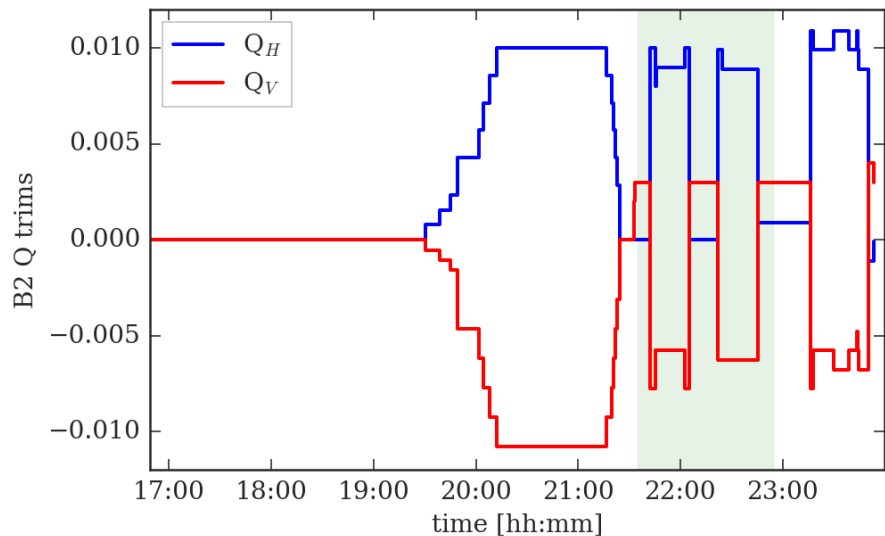
Feedforward on the wires dipolar effect



Positions control during the BBCW use



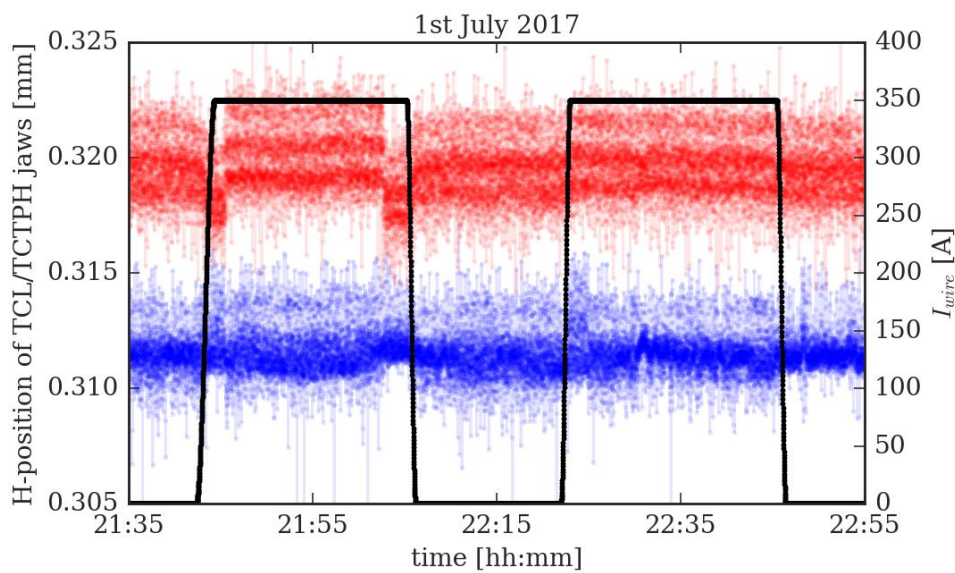
Why we need time and your support (IV)



Feedforward on the wires quadrupolar effect



Tunes control during the BBCW use

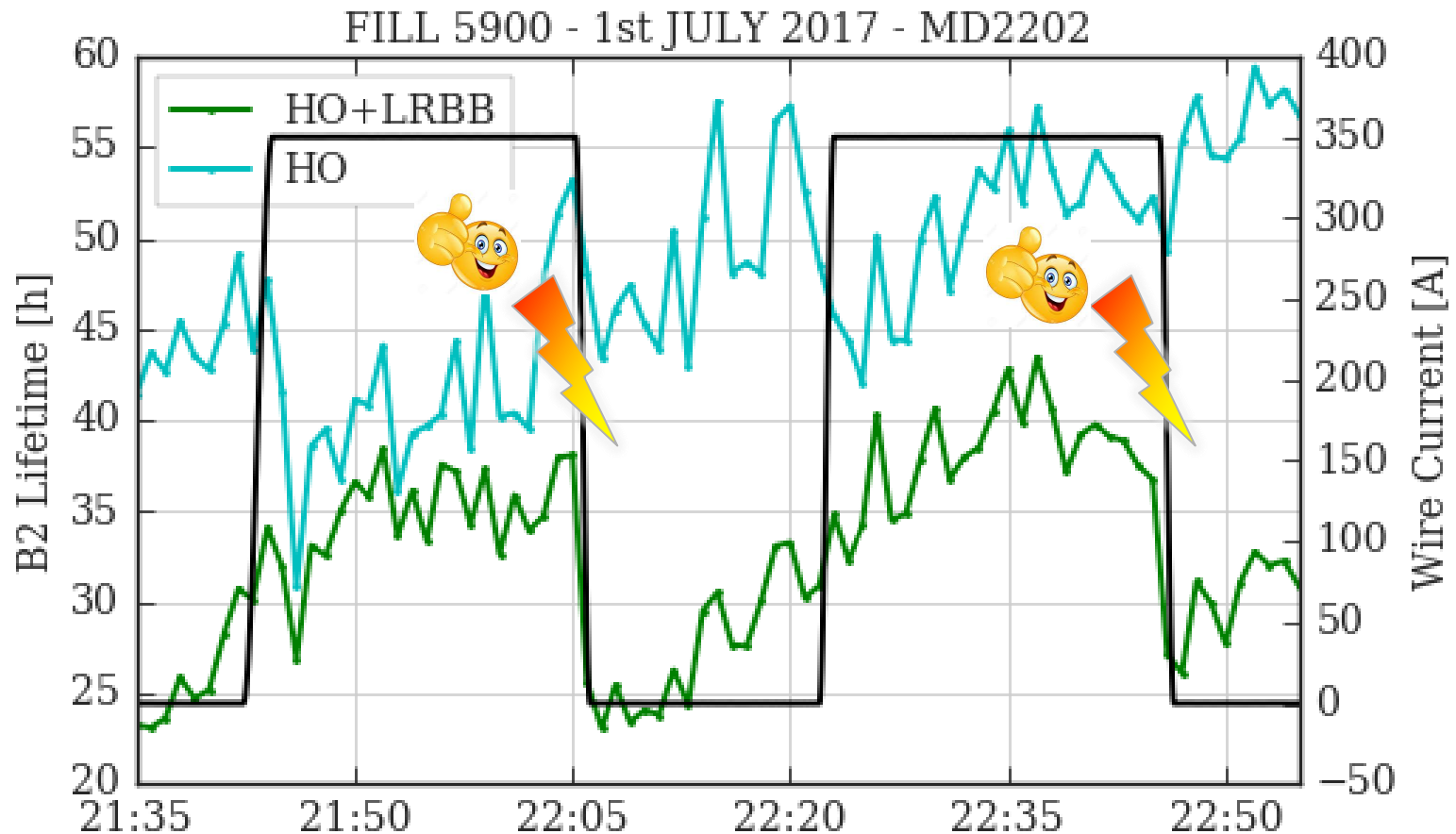


Positive effect of the BBCW (I)



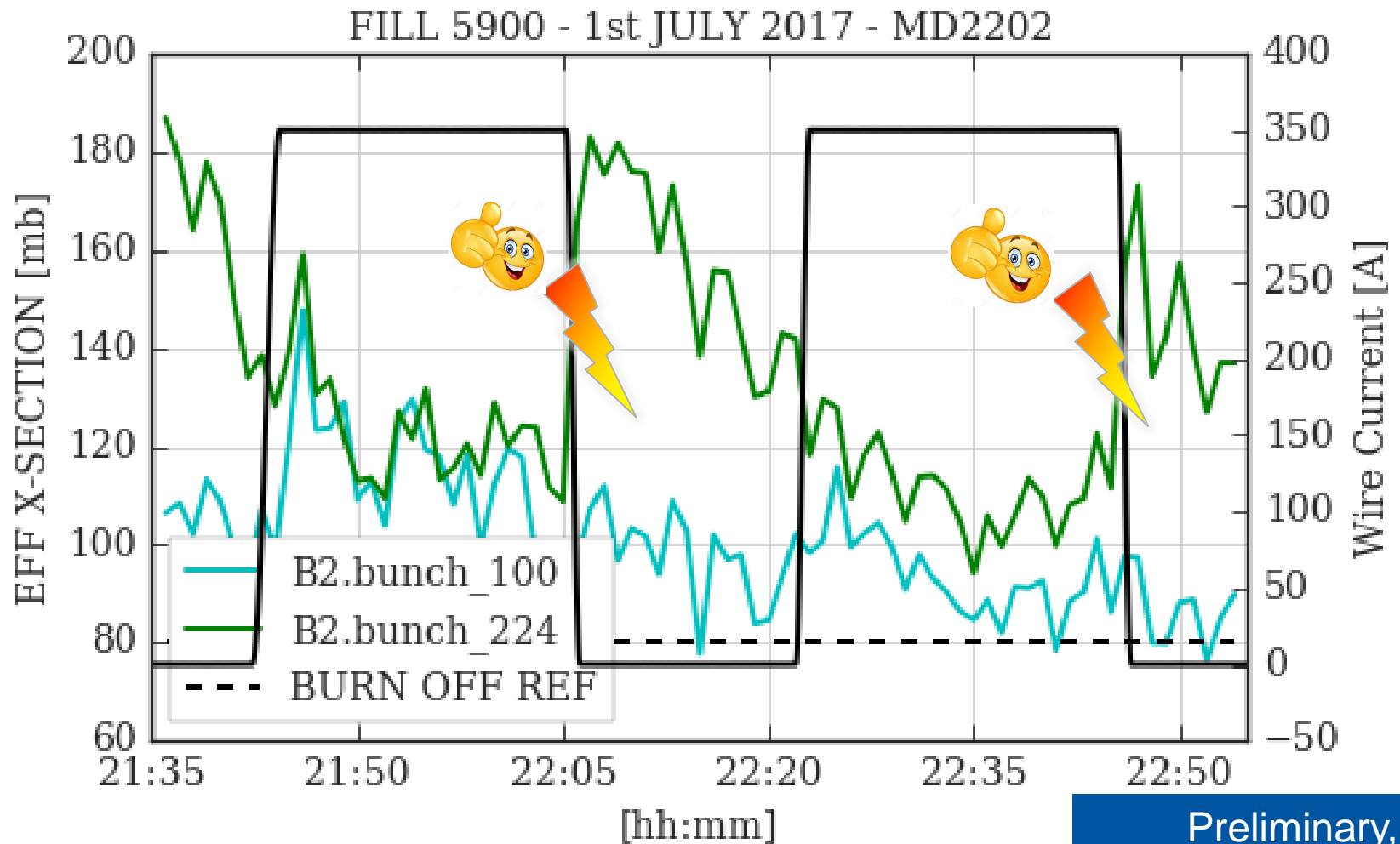
Preliminary,
thanks to Michi and Axel

Positive effect of the BBCW (II)



Preliminary,
thanks Axel

Positive effect of the BBCW (III)



Preliminary,
thanks Nikos and Axel

Thank you for the attention!

