



Contribution ID: 2417 Contribution code: THPM018

Type: **Poster Presentation**

## Optimization of mechanical robustness in the booster injection bumpers

*Thursday, 11 May 2023 16:30 (2 hours)*

During the Long Shutdown 2 (LS2) at CERN, the new Linac4 (L4) accelerator has been successfully connected to the PS Booster (PSB) to inject 160 MeV H<sup>-</sup> beam into the 4 superposed PSB rings. The horizontal displacement of the circulating beam during injection relies on 4 pulsed dipole magnets. During the initial run of the new magnet system, non-conformities have been observed. These could be traced back mainly to early fatigue effects, some of which were in brazed joints on the coil cooling circuit. An extensive program has been launched to improve the brazing technology for the spare coil manufacturing. This effort has been combined with numerical computations as well as destructive and non-destructive testing of brazed joints, allowing to identify critical stress domains resulting in fatigue sensitive areas. This paper describes the applied methodology and implements measures to increase the robustness of the magnet coils. The achieved improvements have been validated by testing based on an instrumented coil, allowing to correlate stress-strain measurements with results from the structural and transient numerical computation.

### Funding Agency

### Footnotes

### I have read and accept the Privacy Policy Statement

Yes

**Primary author:** LACKNER, Friedrich (European Organization for Nuclear Research)

**Co-authors:** ATANASOV, Miroslav (European Organization for Nuclear Research); BALHAN, Bruno (European Organization for Nuclear Research); BAUD, Cedric (European Organization for Nuclear Research); BORBURGH, Jan (European Organization for Nuclear Research); MASSON, Thierry (European Organization for Nuclear Research)

**Presenter:** LACKNER, Friedrich (European Organization for Nuclear Research)

**Session Classification:** Thursday Poster Session

**Track Classification:** MC7: Accelerator Technology and Sustainability: MC7.T35: Advanced Manufacturing Technologies for Accelerator Components