



Contribution ID: 478

Type: **Presentation**

## Thermo-mechanical studies of collimator robustness

*Tuesday 25 June 2019 11:40 (15 minutes)*

Thermo-structural studies of the most loaded primary (TCP) and secondary (TCS) collimators of the FCC were performed for both 1 h Beam Lifetime (BLT) and 0.2 h BLT operating conditions. The simulated collimator has a similar design to primary and secondary collimators used in LHC, though a thicker absorber block in Carbon-Fiber-Carbon (CFC) is adopted. For the early conceptual design, a perfectly bonded assembly was assumed in calculations, to increase the stiffness of the structure. The results highlight a considerably high temperature on the absorber block, especially for the TCP in 0.2h BLT (660 °C), but still without failure. In terms of jaw deflection, the highest value is reached for the most loaded secondary collimator and is around 370  $\mu\text{m}$  away from the beam. However, the onset of plasticity appears on the cooling pipes, an issue that could be cured with alternative materials or geometry.

**Author:** GOBBI, Giorgia (CERN)**Co-authors:** PASQUALI, Michele (CERN); CARRA, Federico (CERN); BERTARELLI, Alessandro (CERN); VARASTEHI, Mohammad (CERN); BRUCE, Roderik (CERN); REDAELLI, Stefano (CERN)**Presenter:** GOBBI, Giorgia (CERN)**Session Classification:** FCC-hh accelerator (EuroCirCol)**Track Classification:** FCC-hh accelerator