Contribution ID: **92** Type: **Poster**

Statistical Analysis of Operational Data of the GTS-LHC Ion Source

The GTS-LHC ECR ion source delivers ion species for the physics programme of the CERN accelerator complex. Stability and reproducibility are key parameters for successful operation, which currently requires regularly intervention by an expert. The integrated functionality of data logging in the control system of the CERN accelerator complex allows all relevant control values and beam properties for the different machines to be stored. For the years 2015, 2016 and 2018, the data for the lead ion operation of the GTS-LHC ion source were extracted from the logging and treated with various statistical methods to identify recurring patterns in the operational settings of the source. If such patterns exist, they may be used in the future for the control of the source by semi-automatic feedback loops. The main study performed was based on a cluster analysis using the Optigrid algorithm, which is well suited for problems with a high number of parameters. The algorithm and selected results considering some operational aspects and ideas on further studies are presented.

E-mail for contact person

detlef.kuchler@cern.ch

Funding Information

Primary author: KUCHLER, Detlef (CERN)

Co-author: MIHAILESCU, Max Eric (University of Bonn (DE))

Presenter: KUCHLER, Detlef (CERN)

Session Classification: Poster Session 1

Track Classification: Production of highly charged ion beams