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## **Multi-objective extremum seeking to control drifts in the transverse beam splitting efficiency of the multi-turn extraction at the CERN proton synchrotron**

*Tuesday, 9 May 2023 16:30 (2 hours)*

Time-varying fluctuations of the intensity sharing between the islands and the core of the beam extracted via the CERN Proton Synchrotron (PS) Multi-Turn Extraction are the main effects that require manual adjustment for this beam type. To mitigate this, the application of an online controller is explored to further enhance both operational autonomy of the accelerator and physics performance. In this contribution a proof of concept implementation of a multi-objective extremum seeking algorithm is presented. The tuning of the PS parameters, the proper choice of the hyperparameters of the algorithm and the achievements reached during the beam studies are summarised.

### **Funding Agency**

### **Footnotes**

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

Yes

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