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Analysis of losses and protection of the electrostatic septum anode wires in SIS18

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The synchrotron SIS18 at GSI uses resonant extraction for slow beam extraction. Recently it was discovered that about 50% of the anode wires of the electrostatic extraction septum were broken during beam operation. In this paper, we present the analysis of the possible loss scenario that led to the anode wire damage and suggest machine protection measures to prevent future damage. The investigations revealed the importance of having access to stored data representing machine parameter settings and their changes as well as signals from devices and beam instrumentation to be able to analyse the events leading to losses. Relevant signals include beam current, beam loss monitor signals, and vacuum pressure. Systems for logging and archiving such data are under development for FAIR, but are not yet routinely available.

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Footnotes

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Yes

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