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## SLS 2.0 machine protection

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The beam abort system for the current Swiss Light Source (SLS) is based on inverting the RF phase to decelerate the stored beam. The losses are localised at longitudinal positions where the dispersive orbit encounters the machine aperture. For the SLS, these losses mainly occur at the septum and in the arcs. For the SLS 2.0\* with its multi-bend-achromat lattice and thus much lower dispersion in the arcs, tracking simulations show that these losses are localised at superconducting super bends and in-vacuum insertion devices. Due to this unfortunate loss distribution and the fragile vacuum chamber combined with the small beam size and stored beam energy of 1 kJ, a more controlled beam abort is desired. In case of an RF failure, the beam abort system must dump the beam safely before the critical dispersive orbit is reached. A fast beam dump controller with dedicated inputs for fast systems such as the low-level RF and fast feedback systems is foreseen for triggering the required emergency beam dump. The majority of the well over 6000 machine interlock signals will be monitored by the slow, programmable-logic-controller-based machine interlock system (MIS). For the MIS the sheer amount of signals poses a challenge.

### Funding Agency

### Footnotes

- Braun, H., Garvey, T., Jörg, M., Ashton, A., Willmott, P., Kobler, R., ... Zehnder, E. (2021). SLS 2.0 storage ring. Technical design report. (PSI Bericht, Report No.: 21-02). Paul Scherrer Institut.

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