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## ACTIVATION AND "HANDS-ON" MAINTENANCE CRITERIA FOR HEAVY-ION ACCELERATORS

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In the frame of the FAIR project (Facility for Antiprotons and Ion Research) residual activity induced by heavy ions was studied both experimentally and numerically using Monte Carlo particle-transport codes. In the present work we report on the validation of the transport codes FLUKA and SHIELD based on the measurements of the residual activity of copper and stainless steel targets irradiated with uranium and argon beams at different energies. After the validation, the codes were used for simulations of the residual activity in two beam-loss scenarios representing: 1) losses in a beam pipe of an accelerator and 2) losses in a bulky accelerator structure like a magnet yoke or a coil. The main task of the study was establishing a scaling law that expands the existing '1 W/m' criterion for proton machines to heavy-ion accelerators. This scaling law enables specifying beam-loss criteria for all projectile species from proton up to uranium at energies from 200 MeV/u up to 1 GeV/u.

**Primary author:** Dr STRASIK, Ivan (GSI Darmstadt, Germany)

**Co-authors:** Dr MUSTAFIN, Edil (GSI Darmstadt, Germany); Prof. PAVLOVIC, Marius (FEI STU Bratislava, Slovak Republic); Prof. SOBOLEVSKIY, Nikolai (INR RAS Moscow, Russia)

**Presenter:** Dr STRASIK, Ivan (GSI Darmstadt, Germany)

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