

Design and development of Super-FRS target area components and remote handling

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With the Super-conducting Fragment Separator (Super-FRS) at FAIR, rare isotopes of all elements up to uranium will be produced via fission or fragmentation in flight. The primary beam is converted in a graphite wheel target and separated in the following magnetic separator. The separator is surrounded by many meters of shielding with gaps for the beam line vacuum chambers, which are connected by up to 1.2 m wide pillow seals. Inside the chambers, various devices (target, beam diagnostic detectors, a collimator, and beam dumps) are mounted on shielding plugs. The target and the beam dump suffer from radiation damage due to the heavy-ion beam and regular maintenance will be required. To conduct the remote maintenance, the plugs will be transported from the beamline using a 60 ton (5.8 m high) shielding flask to a hot cell. The hot cell will be equipped with master-slave manipulators and a power manipulator to replace the consumable parts and carry out the remote maintenance.

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