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New shielded collection chamber for medical isotope collections

Recent preclinical experiments using Tb isotopes produced at ISOLDE enabled significant progress in the field, including the first demonstration of PET imaging with an alpha emitter [1] and the demonstration of ^{152}Tb as theranostic match for the clinically used ^{177}Lu therapeutic isotope [2]. These successes enormously raised the interest of the medical community and a first clinical application using ^{152}Tb could be performed in 2016 [3]. The activities required for this and future work are of the order of several hundred MBq and result in consequent dose rates. Thus, to follow the ALARA rules, manual manipulation should be minimized and a dedicated shielded collection chamber is required for such collections. Different concepts for such a shielded collection chamber were developed in the frame of the ENSAR2-TECHIBA-RITMI project and discussed with the Swiss Federal Office of Public Health (the radiation protection supervisory body of CERN). The newly designed collection chamber was constructed and tested at ILL, then installed at ISOLDE. A first commissioning run was successfully performed in September 2017 and two high activity collections of ^{152}Tb were made for preclinical experiments at PSI.

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References:

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- [2] C Müller et al. *EJNMMI Research* 2016;6:35. DOI 10.1186/s13550-016-0189-4
- [3] RP Baum et al. *Dalton Trans* 2017; in press. DOI 10.1039/C7DT01936J

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