^{163}Ho distillation and implantation for the HOLMES experiment

The HOLMES experiment aims to directly measure the ν mass with a calorimetric approach [1]. The choice of 163Ho as source is driven by the very low decay Q-value (~ 2.8 keV), which allows for high sensitivity with low activities (O(102)Hz/detector), thus reducing the pile-up probability. 163Ho will be produced by neutron irradiation of 162Er2O3 then chemically separated; anyway, traces of others isotopes and contaminants will be still present. In particular 166mHo has a beta decay (τ ~ 1200y) which can induce background below 5 keV. The removal of the contaminants is critical so a dedicated system has been set up. It is designed to achieve an optimal mass separation @163 a.m.u. and consists of two main components: an evaporation chamber and an ion implanter. The first item is used to reduce Ho in metallic form providing a target for the ion implanter source. The implanter is made by the sputter source, an acceleration section, a magnetic dipole, a x-y scanning stage and a focusing electrostatic triplet. In this contribution we will describe the procedures for the Holmium “distillation” process and the status of the machine commissioning.