**Specifications Sheet: Ground Shell**

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**Functional specifications:**

The ground shell is designed to shield electronics, UCN guide, fiber optics, vacuum tank flanges, etc. from high voltage/electric fields of the precession chamber. It should also be isolated from the ground electrodes and each half of the shell has the option to be isolated from each other, for leakage current monitoring purposes. The shell needs openings for the HV feedthrough and Hg laser light. The ground shell should also allow to have large enough openings to avoid pumping restrictions.

**Ground shell dimensions:**

The ground shell needs to shield sharp edges on ground (e.g. on the vacuum tank) from HV and large electric fields, respectively. The profile of the shell needs to be in a shape to minimize the electric field at the HV electrode corona, and minimize the field on the vacuum chamber flanges. The shells diameter is limited by the vacuum chamber diameter, however, some further space in the diameter must be allowed for installation. This would give room for access of the neutron guides, Cs cells, Hg polarizer, and any additional support structure. Hence, about 100-200 mm separation between the vacuum chamber wall and the ground shell would be acceptable.

**Vacuum pumping:**

The ground shell cannot restrict the vacuum chambers target pressure of a water partial pressure of $5×10^{-6} mbar$ by slowing the pumping speeds or by trapped volumes (virtual leaks) inside the shell.

**Magnetic properties of the construction material:**

Construction of the ground shell must be made of non-magnetic materials, such as aluminum. As the ground shell is close to the precession chamber, measured fields on the surface has to be $<20 pT$, at a distance of 5 cm from the dipole. Magnetizability of every pieces must be measured at PTB.