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## Electron source for an improved hot cathode ion gauge

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We assume that a hot cathode ion gauge can be made more stable by using an electron source for introducing an accelerated electron beam into the ionization volume in a straight path. By doing so, the electron trajectories, kinetic energy and current inside the ionization volume could be well defined and stable. The electron beam should have an energy of about 200 eV for stable ionizing the gas. In absence of a convenient complete commercial solution for our application we started to investigate electron guns by simulation and experiment. Key parameters like electron transmission efficiency and tolerances have been investigated as a function of the source geometry and potentials. The possibility of suppressing unwanted secondary effects depends on the spacial distribution of the electrons. The simulations have been carried out using the COMSOL Multiphysics 5.0 software. The packages AC/DC>electrostatics and AC/DC>Particle Tracing>Charged Particle Tracing have been used. The work is a part of the EURAMET EMPIR project "16NRM5-ion gauge".

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