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P4.044 Neutrino mass analysis strategy for the Karlsruhe Tritium Neutrino Experiment (KATRIN)

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The Karlsruhe Tritium Neutrino (KATRIN) experiment uses the kinematics of tritium β -decay to determine the electron antineutrino mass with a sensitivity of $m_{\nu} = 200 \text{ meV} / c^2$ (90% C.L.). In order to measure the decay electrons it is important to guide them adiabatically from the source to the spectrometer. In addition the diffusion of tritium into the spectrometers from the source has to be reduced by 14 magnitudes of order as tritium inside the spectrometers would induce additional background. For these two tasks the transport and pumping section were constructed. The last part of this section is the Cryogenic Pumping Section (CPS), which aims to reduce the residual gas flow by not less than seven orders of magnitude. For this a 3K cold argon frost area (surface $\approx 2\text{m}^2$) will be prepared to adsorb the incoming tritium molecules.

Before the whole KATRIN setup will be connected together the performance of CPS will be tested by its own. This poster presents the measurement results of the first Cool-Down of the CPS.

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