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# Status of the MainzTPC Upgrade for Precision Low-Energy Recoil Measurements in Liquid Xenon

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The MainzTPC is an experimental dual-phase xenon time projection chamber (TPC) dedicated to the study of scintillation and ionization processes in liquid xenon (LXe) for low-energy electronic and nuclear recoils. It has been designed to be the primary target in Compton and neutron scattering experiments to measure recoil energies in LXe down to 1 keV.

To improve position resolution in $x$ and $y$, the MainzTPC was redesigned to accommodate an array of 36 individually read-out silicon photomultipliers (SiPMs) in place of its monolithic top photomultiplier tube (PMT) and eight avalanche photodiodes. A primary goal of this upgrade is to enable sensitive measurements of low-energy nuclear recoils in LXe, in particular of the Migdal effect.

For this purpose, dedicated simulations of the detector response were performed. Additionally, a cryogenic amplifier board housing the SiPM array was developed and built. To address known instabilities in the liquid level, we rebuilt the level meters and level control based on camera observations of the liquid-gas interface. We report on the status of this work.

**Primary author:** Mr SZYSZKA, Constantin (Johannes Gutenberg-Universität Mainz)

**Co-authors:** DEISTING, Alexander (Johannes Gutenberg-Universität Mainz); Dr HILS, Christopher (Johannes Gutenberg-Universität Mainz); MERZ, Johannes (Johannes Gutenberg-Universität Mainz); Mr GYÖRGY, Peter (Johannes Gutenberg-Universität Mainz); Prof. OBERLACK, Uwe (Johannes Gutenberg-Universität Mainz)

**Presenter:** DEISTING, Alexander (Johannes Gutenberg-Universität Mainz)

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