

NeuLAND: MRPC-based time-of-flight detector for 1 GeV neutrons

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The NeuLAND detector at the R3B experiment at FAIR aims to detect fast neutrons (0.2-1.0GeV) with high time and spatial resolutions ($\sigma_t < 100$ ps, $\sigma_{x,y,z} < 1$ cm). The detector will consist of about 60 subsequent MRPC stacks containing a 4mm thick anode made of iron converter material, with an additional 4mm of converter material between two stacks. The secondary charged particles stemming from hadronic

interactions of the high energetic neutrons in the converter will be detected in the MRPC's.

As part of the ongoing development effort, at FZD and GSI a number of prototypes for this detector have been developed and built. By testing these prototypes in experiments with picosecond electrons at ELBE (Dresden, Germany) and with 175 MeV quasi-monochromatic neutrons at TSL (Uppsala, Sweden) it was shown that the working principle is sound.

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