

Baby MIND readout electronics architecture for accelerator neutrino particle physics detectors employing silicon photomultipliers

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The Baby MIND neutrino particle detector was installed at J-PARC in Tokai Japan in February 2018 and commissioned with first neutrino beam a few weeks later. It is instrumented with 3'996 Hamamatsu MPPCs type S12571-025C. A full readout electronics chain was developed to extract energy deposition and timing information of tracks left by charged particles from neutrino interactions in the Baby MIND and surrounding structures. Data from particle beam tests at CERN and commissioning at J-PARC are presented, to illustrate how the electronics readout architecture fulfils the physics requirements. A brief description of the adoption of this architecture for planned 60'000 MPPCs of a new 3D fine grained scintillator detector for operation at J-PARC from 2021 is given.

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