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# Readout electronics for the CEE Zero Degree Calorimeter at HIRFL

The CSR External-target Experiment (CEE) at the Heavy Ion Research Facility at Lanzhou (HIRFL) will be the first large-scale experiment in nuclear physics independently developed in China, covering the GeV energy regime. Experimental studies utilizing CEE aim at many physical goals, including the phase structure of cold and high baryon density nuclear matter and the equation of states of cold asymmetric nuclear matter at supra-saturation densities. As a major detector, The Zero Degree Calorimeter (ZDC) measures the centrality and reaction plane of the nuclear-nuclear collision from the hadron background. It comprises Plastic Scintillator (PS) crystal bars with a fan-shaped size for each. The PS bars are approximately trapezoidal and directly coupled with a PMT (photomultiplier tube) to convert charged particles into electrical signals. The readout electronics consists of 12 FEE (Front End Electronics) modules, the sub-trigger module, and the sub-clock module. In addition, there is one HV (High Voltage) crate providing a high voltage supply for the PMTs to provide power supply for the nearby PMTs. Comprehensive tests have been performed on the readout electronics. The test results indicate that the noise performance is less than 0.4 mV (RMS), the nonlinearity of the full readout electronics is less than 0.06%, and the inconsistency among channels is less than 2.5%. In addition, cosmic ray test results demonstrate that the readout electronics can reach good performance.

## Minioral

Yes

## IEEE Member

No

## Are you a student?

No

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