



Contribution ID: 412

Type: **Poster presentation**

## Design of Front End Electronics for direct dark matter detection based on LAr

*Thursday 14 June 2018 15:50 (1 minute)*

Liquid argon (LAr) with a high light yield of approximately 40 photons per keV is an attractive target for the direct detection of WIMPs, which are well motivated galactic dark matter candidates. In this paper, we present a front end electronics design for a LAr dark matter detector with the scintillation read out by PMT, which has an input dynamic range from 5pC to 1nC, and high resolution that single photoelectron can be distinguished. The design consists of 8 preamplifier modules (PAMs), 2 Front end Digital Modules (FDMs) and a Trigger Clock Module (TCM). The FDMs are each equipped with two 14-bit 1-GSPS analog-to-digital converters (ADCs), and the performance of prototype FDM had been test in lab (e.g. Enob is 10.18 bits @175MHz). Moreover, this prototype FDM had been tested with LAr detector collaboratively and test results are also presented.

### Description

system

### Institute

USTC

### Speaker

Xing Zhu

### Country

China

### Minioral

Yes

**Primary authors:** Mr ZHU, Xing (State Key Laboratory of Particle Detection and Electronics, University of Science and Technology of Zhongtao; Prof. FENG, Changqing (State Key Laboratory of Particle Detection and Electronics, University of Science and Technology of China, Hefei 230026, China; Department of Modern Physics, University of Science and Technology of China, Hefei 230026, China); Prof. LIU, Shubin (State Key Laboratory of Particle Detection and Electronics, University of Science and Technology of China, Hefei 230026, China; Department of Modern Physics,

University of Science and Technology of China, Hefei 230026, China); Prof. AN, Qi (State Key Laboratory of Particle Detection and Electronics, University of Science and Technology of China, Hefei, 230026, China; Department of Modern Physics, University of Science and Technology of China, Hefei, 230026, China)

**Presenter:** Mr ZHU, Xing (State Key Laboratory of Particle Detection and Electronics, University of Science and Technology of China, Hefei, 230026, China)

**Session Classification:** Poster 2

**Track Classification:** Data Acquisition