The Phase II upgrade of the ATLAS Liquid Argon detector includes a 17 bit dynamic range front end amplifier with a two or three gain multi-pole shaper employing CR-\((RC)^n\) shaping. Each gain stage of the shaper will be followed by a 40Mspo, 14b dynamic range, 12-13b ENOB digitizer, serializer and fiber optic driver. A study is underway to see if a single technology (65nm or 130nm CMOS) will be suitable for all blocks up to the optical Link, enabling consideration of the development a Front End System On a Chip (FESOC).

Preamp Requirements: Input termination selectable 25Ω or 50Ω
Maximum Signal Current 10mA (25Ω term)
LAr pad / strip capacitance .16 to 2nF
Linear Dynamic Range 17 bits.

14-bit Split-SAR ADC prototype UT Dallas¹/ SMU²
Hongda Xu¹, Yongda Cai¹, Ling Du¹, Datao Gong², and Yun Chiu¹

10Gbps 4 ch Fiber Driver 2 Designs

Atx array Optical Transmitter
12 ch. Tx with Prizm Light Turn Connector