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A charge amplifier for VUV photomultiplier operating in cryogenic environment.

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We present the design and the performance of a preamplifier operating in a cryogenic environment, potentially interesting for noble liquid detectors. The circuit design has been constrained by requirements of low power consumption (2mA), low noise (250 microV) and use of commercial components. The gain is 10 with a bandwidth of 100 MHz. The optimal configuration has been obtained by using a cascade of two AD8011 Op-Amps.

The amplifier has been integrated onto a PCB with a voltage divider, customised for cryogenic temperature, and coupled to an Hamamatsu R11410 photomultiplier tube. The system has been tested simulating operations in liquid xenon by using VUV light pulses in a controlled bath of liquid nitrogen to keep the temperature close to -100 °C.

Performance and further improvements are presented.

Primary authors: Dr DI GIOVANNI, ADRIANO (NEW YORK UNIVERSITY ABU DHABI); Prof. ARNEODO, Francesco (NEW YORK UNIVERSITY ABU DHABI)

Co-authors: Dr FRANCHI, Giovanni (AGE Scientific); Mr PAZOS CLEMENS, LUIS (NEW YORK UNIVERSITY ABU DHABI); Dr D' INZEO, Marco (AGE Scientific)

Presenter: Dr DI GIOVANNI, ADRIANO (NEW YORK UNIVERSITY ABU DHABI)

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