

A CMOS VARIABLE GAIN AMPLIFIER FOR PHENIX ELECTROMAGNETIC CALORIMETER AND RICH ENERGY MEASUREMENTS

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A variable gain amplifier (VGA) has been developed for equalizing the gains of integrating amplifier channels used with multiple photomultiplier tubes operating from common high-voltage supplies. The PHENIX lead-scintillator electromagnetic calorimeter will operate in that manner, and gain equalization is needed to preserve the dynamic range of the analog memory and ADC following the integrating amplifier. The VGA is also needed for matching energy channel gains prior to forming analog sums for trigger purposes. The gain of the VGA is variable over a 3:1 range using a 5 bit digital control, and the risetime is held between 15 and 23 ns using switched compensation in the VGA. An additional feature is gated baseline restoration. Details of the design and results from several prototype devices fabricated in 1.2- μm Orbit CMOS are presented.

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