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Research of pure CsI crystal readout by APD for ECL end cap of BELLE II

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BELLE II is the upgrade of BELLE by 40 times luminosity, investigating the CP-violation effects. In order to cope with the extremely high luminosity at Belle II, utilizing fast pure CsI scintillation crystals at end cup of ECL has been proposed. Silicon avalanche photodiodes (APD) are considered as a candidate of photosensitive elements to get the acceptable level of the electronic noises. In University of Tokyo, a counter with one pure CsI scintillation crystal coupling one or two or four APD has been studied. The shot noise, thermal noise and addition noise are measured respectively. The total ENC (equivalent noise charge) has been calculated and compared with the value measured experimentally. By calibration of the cosmic ray, the ENE (equivalent noise energy) of the counter has also been measured. We confirm that with pure CsI scintillation crystals readout by 2 S-8664-1010 APDs, the expectation of total noise at 0.6 MeV can be obtained.

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