

# PMT Gain description

PMT in test	HV	Gain(*10 <sup>6</sup> )	Gain description	
THU PMT	1000V	3.1	Sk/sp method	Applied in NPE calculation of THU test
		2.2	SPE method, tested in IHEP, Beijing	
		2.5 (Test recently)	SPE method, tested in SDU, Jinan	Applied in NPE calculation of SDU test
SDU PMT		3.18		In test, preliminary result shows about 600 P.E., reason incheck

Two method of Gain acquisition:

- **Sk/sp method:** Use continuous light exposed to the cathode(window) of PMT, the Gain calculated by the ratio of anode output signal and electron emitted from cathode. (This method may use in industry, to monitor continues radiation signal, and the readout would be as simple as the average current.)
- **SPE method:** Get the absolute charge gain of single electron firstly, and NPE equal to the total charge of signal divided by the SPE charge.

Note: 2.5\*10<sup>6</sup> Gain of THU PMT is tested by light irradiate the whole cathode, since we just use the center of PMT window, the actual gain will be a little larger(around 5%).

# Test and test result

- Tested by QDC(only total charge acquired)
- FADC test will be performed soon, **more reliable**
- The Gain use in calculation is  $2.5 \times 10^6$ , and fitted by gauss function, achieve **804.8** PE.

