The PMT Mass Testing Systems for JUNO

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20000 20" PMTs

15k by NNVT (MCP)
5k by Hamamatsu (dynode)

3%/$\sqrt{E_{\text{vis}}}$

- Detection efficiency @420nm
- TTS of Single Photon Events
- Rise Time / Fall Time
- HV to reach gain of $10^7$
- Dark Count Rate
- P/V Ratio
- Pre- and After-pulse Ratio
- High Uniformity of PDE

Detailed test of all PMTs

PMT MASS TESTING CONTAINER SYSTEM

PHOTOCATHODE SCANNING STATON
CONTAINER SYSTEM:
- Commercial electronics used
- Fully automated data taking system

Daily testing routine @ Zhongshan, CHINA

SCANNING STATION:
- Scan over whole photocathode
- 2D result map for PDE

Already ~ 5000 PMTs tested!