Delivery of RPC Gas Prototype System to IHEP

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RPC gas prototype system and module test facility

The Daya Bay RPC gas prototype system has been delivered to IHEP on 11/20/2008.

With Changgen and Jiawen's support and Guan Mengyun, Qian Shen and Xu Jilei's help, this system has been successfully installed on 11/21, and is continuously running up to date.

The system is installed at the RPC module test lab, in which the assembled RPC module will go through a final performance test. The prototype gas system can provide 16 gas channels that is enough for 8 RPC modules flowing gas simultaneously. The user's manual of this system is posted as DocDB #2877:

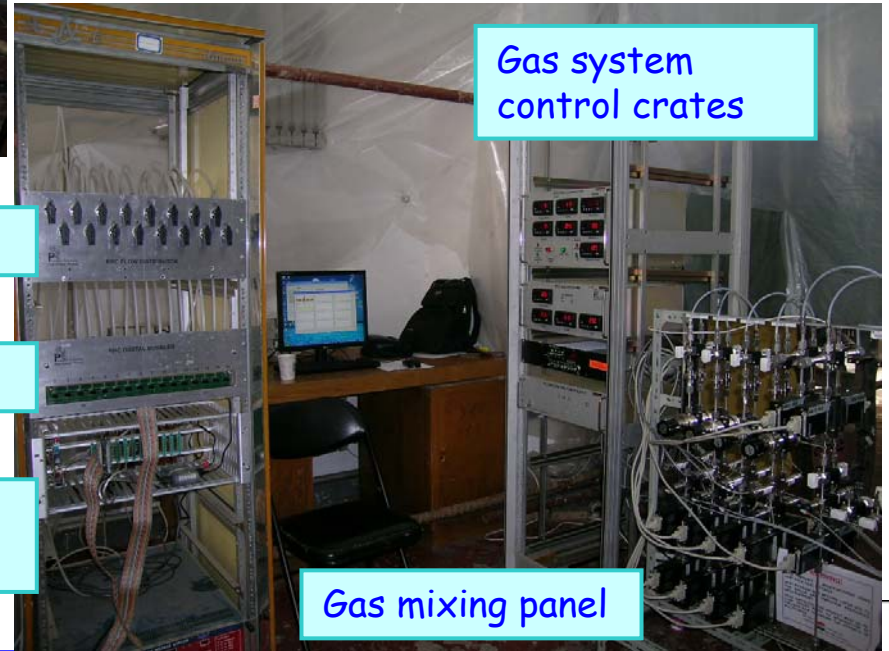http://dayabay.ihep.ac.cn/cgi-bin/DocDB/ShowDocument?docid=2877

IHEP RPC module test lab

Gas distribution/digital bubbler crates

RPC Module rack, can hold 7 modules simultaneously.

Gas system control crates

Gas distribution crates

Digital bubbler crates

Digital bubbler readout crates

Gas mixing panel

The module assembling work has started on 11/21, the first module will be ready on 11/24, IHEP will start the module test soon after.

Superconducting magnet nearby

RPC module delivering table, which can lift the module to the height on module rack. Gas system is behind the module rack.

Performance of digital bubbler system

Continuously run the system for three days the gas prototype system performs quite well. The bubbling rate for all 16 channels are quite stable.

Bubbling rate of channel #1 & 2 for more than 600 runs, the time interval between runs is ~5'.

Microcontroller recorded bubble pulse shape
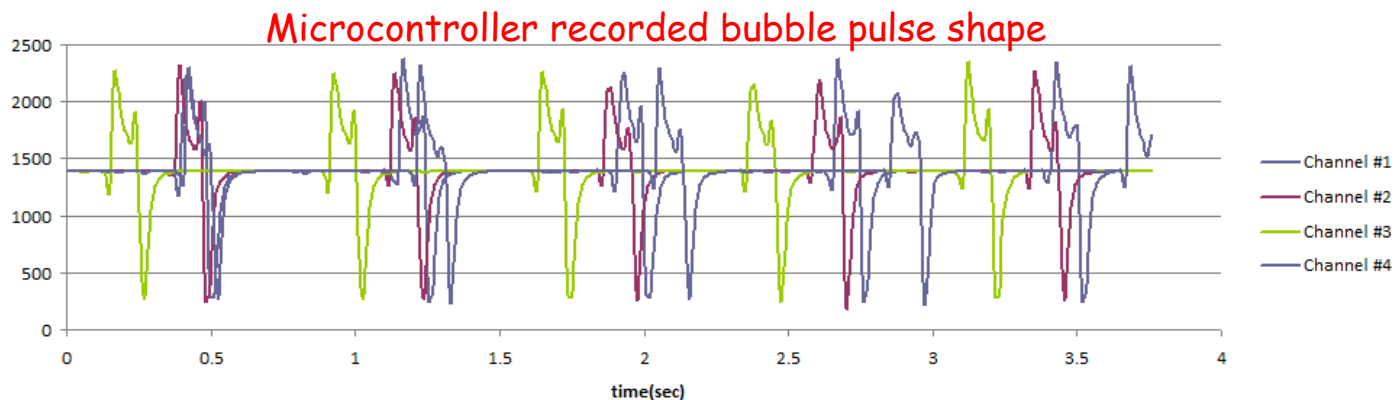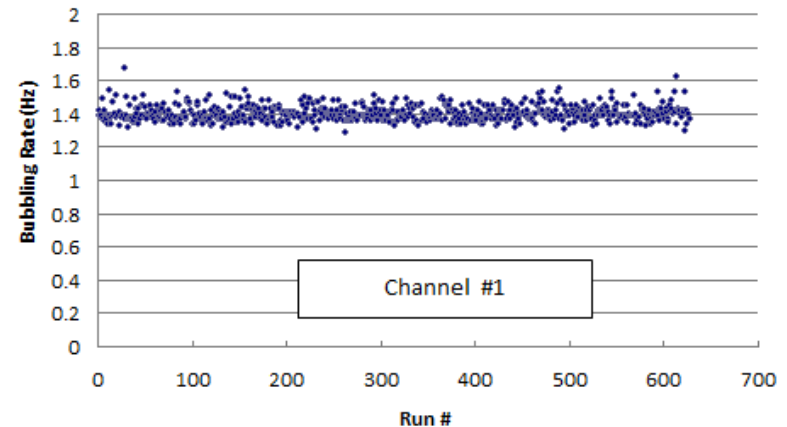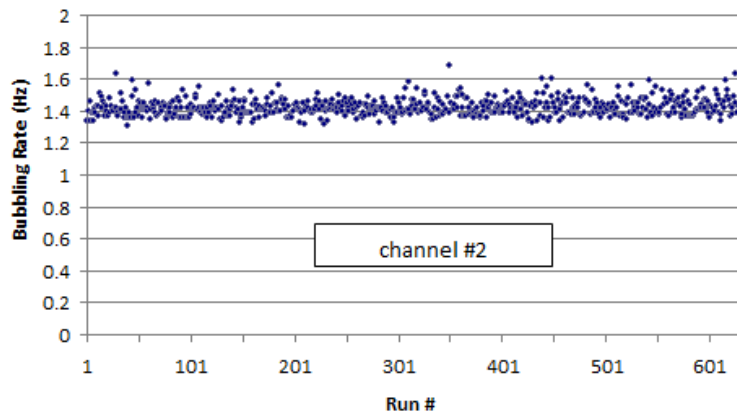
Daya Bay RPC baseline gas mixture

Daya Bay RPC baseline gas mixture: Ar/R134A/Isobutane/SF6 (65/30/4/0.5) is different from OPERA gas mixture (75/20/4/0.5). The gas system was running for OPERA gas mix at Princeton. At IHEP we have recalibrated the system for Daya Bay RPC baseline gas mix, which will be used for RPC module test.

After working with me through out the complete gas system installation, Jilei Xu has acquainted this system and will take care of this system at IHEP.

Slow control

I have shown this gas system to slow control group (Xiaonan, Ye Mei, Zhang Yinghong, ...) and discussed how to integrate the gas system into the Daya Bay slow control system.

To integrate the gas system control crates signals into slow control system is rather straight forward. To integrate the digital bubbler system into the slow control system some additional software work needs to be done. Princeton bubbler control program is written in C#, and already provides a database, in which all relevant data are available. IHEP want to put everything into their LabView framework. Zhang Yinghong will work on this. From long term maintenance point of view, this is a good idea: The entire Daya Bay slow control software will be in a same LabView framework.