

S7 operation update

Eric Dufresne, TRR group meeting, Dec. 19, 2006

- ED was able to set up 2 channels of independent Quad-BPM on 7ID. A new laser BPM will be tested in the future. The 7ID-B x-ray BPM needs a permanent mounting structure with a new XY stage.
- EL wrote a nice report on the measurement of the jitter between the laser and P0 delivered to users.
- DW planned an upgrade of the 7ID-C station this fall. In 2007, a new 7ID-C Huber 6-circle will be commissioned and a new controls station will be added for 7ID-C next to the new 7ID-D workstation on the Wrightline wall. The plans includes upgrading the 7ID-C crate to EPICS 3.14.
- EL is designing a new laser labyrinth to deliver the laser beam to 7ID-C.
- We are also developing plans to bring AC in 7ID-C in the new year. Several labyrinths needs to be opened on the roof of 7ID-C.
- We plan to install also a new cable tray near 7ID-D.
- DA plans to upgrade the 7ID-A mono to a stepper motor on the Bragg angle theta. He is developing a plan to cool the second crystal of the monochromator.

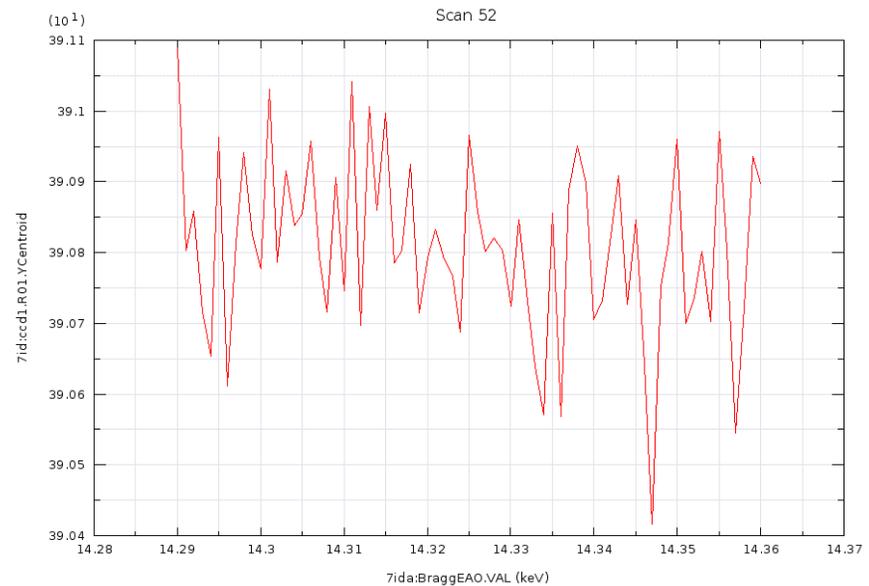
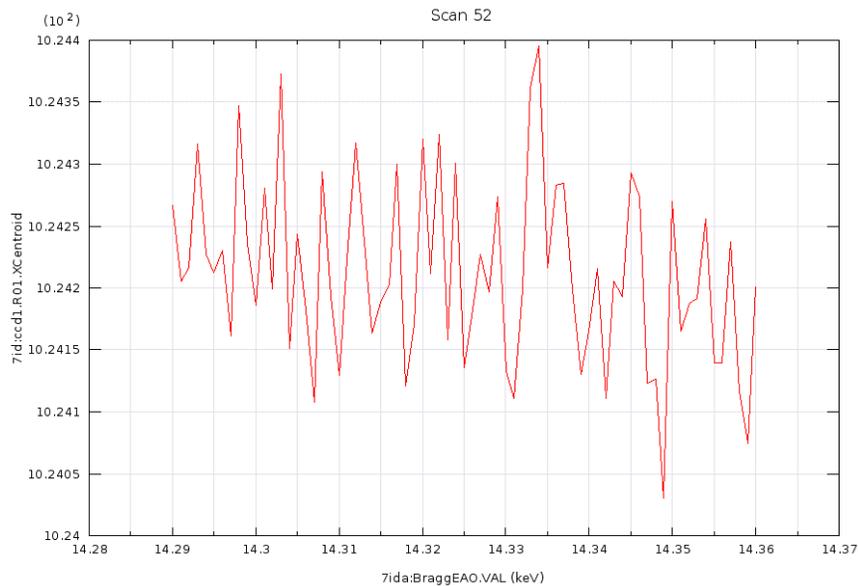
User science and support

- With the group of Jacob Jones and Paul Evans, we performed a demonstration experiment studying the fast high-field response (1000V, a few μs) of piezoelectricity in bulk ceramics.
- The group of Linda Young collected a good data set from their week of hybrid mode. The mono and laser were quite stable during scans (within a μm).
- The new diamond mono was used in an imaging experiment by the group of Prof Wayne Jones and Roy Clarke (UofM) in 7ID-B. The experiment was quite successful.

7ID R&D

- A Partner User proposal written by EL and collaborators was approved for developing the instrumentation and first experiments of the new ps-source to start by the beginning of 2008 on 7ID. The PUP will start in 2007-1.
- BA organized the visit of Prof. Scully for the Dec. 06 APS Colloquium.
- JW and partners are developing a plan to complete the 7BM beamline for imaging of fuel sprays. ED and Mark Erdmann (AES) are working on a draft design of the beamline.
- Jin organized a ps-workgroup meeting in Dec.

Mono performance



CCD X and Y centroid at KB focus in 7ID-D through a near-edge Scan of the Kr edge. Note x100 and X10 multiplier on plots...

From EL's report on PO jitter

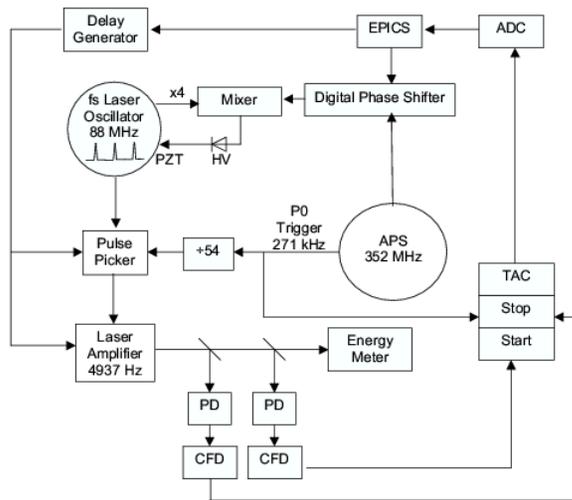


Figure 1. Experimental setup for measuring trigger timing jitter compared to laser arrival time. PD = GHz photodiode (ThorLabs DET 210), CFD = Constant Fraction Discriminator (Ortec 935), TAC = Time-to-Amplitude Converter (Tennelec 862 on 50 ns range), ADC = Analog-to-Digital Converter (Canberra 9635 ADC).

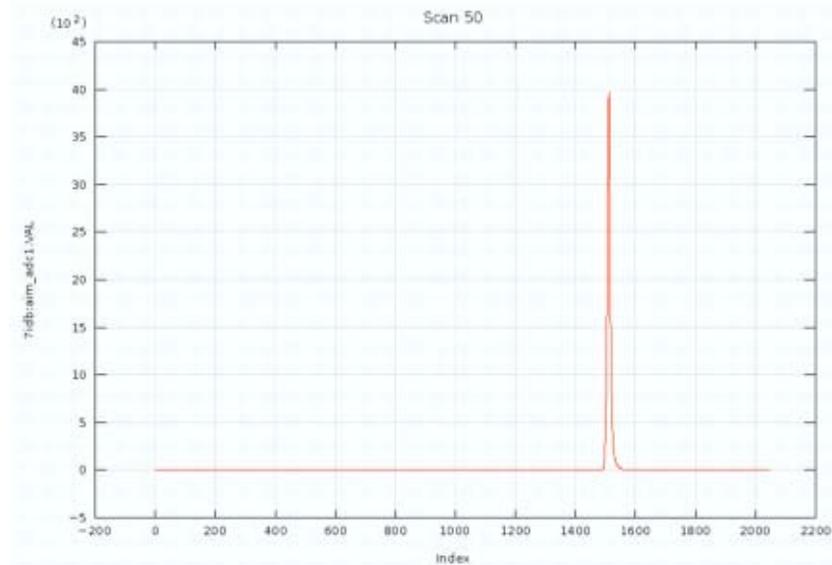
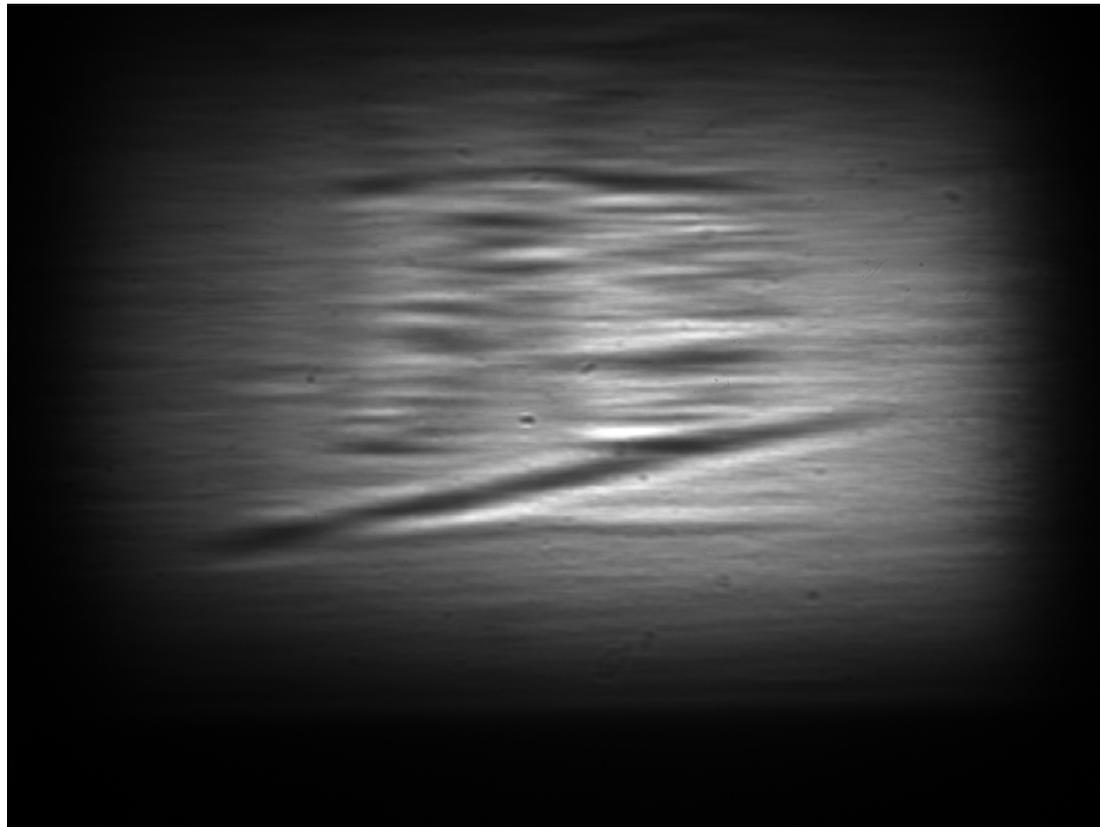


Figure 2. Representative arrival time histogram showing uncorrected laser-to-P0 jitter. The rms of this distribution is 5.1 channels, or 65 ps.

Diamond mono beam profile in 7ID-B, ~36m from source



Mono at 8.4 keV FOV 1.8mmx1.35mm res. A few μm