nanoBPM schedule

California Institute of Technology
Toyoko Orimoto
Cornell University
Robert Meller
DESY
Vladimir Vogel
KEK
Hitoshi Hayano, Yosuke Honda, Nobuhiro Terunuma, Junji Urakawa
Lawrence Berkeley National Laboratory (LBNL)
Yury Kolemensky
Lawrence Livermore National Laboratory (LLNL)
Carl Chung, Pete Fitsos, Jeff Gronberg, Sean Walston
Royal Holloway, University of London (RHUL)
Stewart Boogert
Stanford Linear Acelerator Centre (SLAC)
Joe Frisch, Justin May, Douglas McCormick, Marc Ross, Steve Smith, Tonee Smith, Glen White
University of Cambridge, UK
Mark Thomson, Mark Slater, David Ward
University College, London (UCL)
Alexey Lyapin, Steve Malton, David Miller

NanoBPM schedule

- Still interest in continuation of nanoBPM in ATF2
  - Need for BPM test stand
  - Processing electronics and algorithms
    - First/early pulse calibration
    - Automation and readout

  - BPM stabilization, thermal, mechanical
    - Thermal monitoring and control
    - Position (nanoGrids)
    - Triplet stabilisation with wrt to other BPM systems
      - Mona Lisa
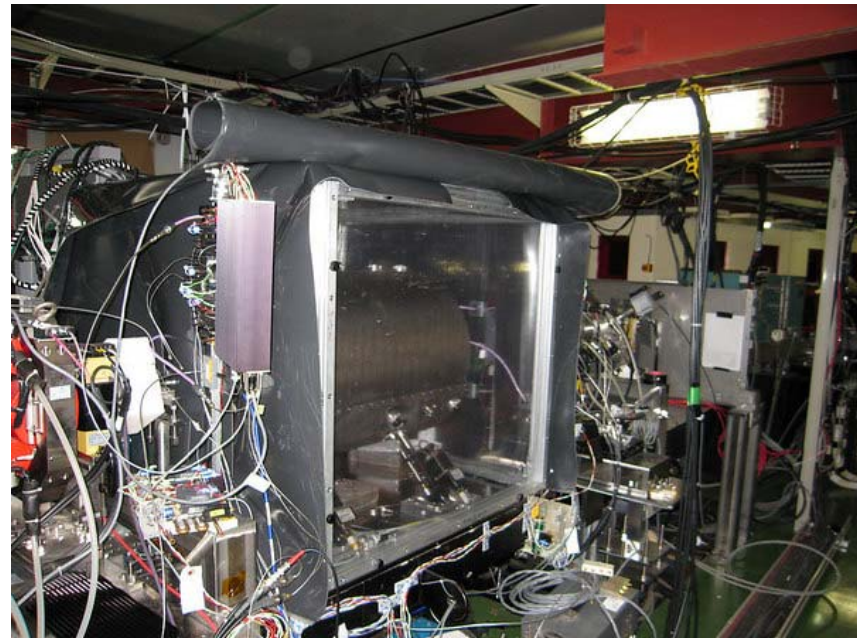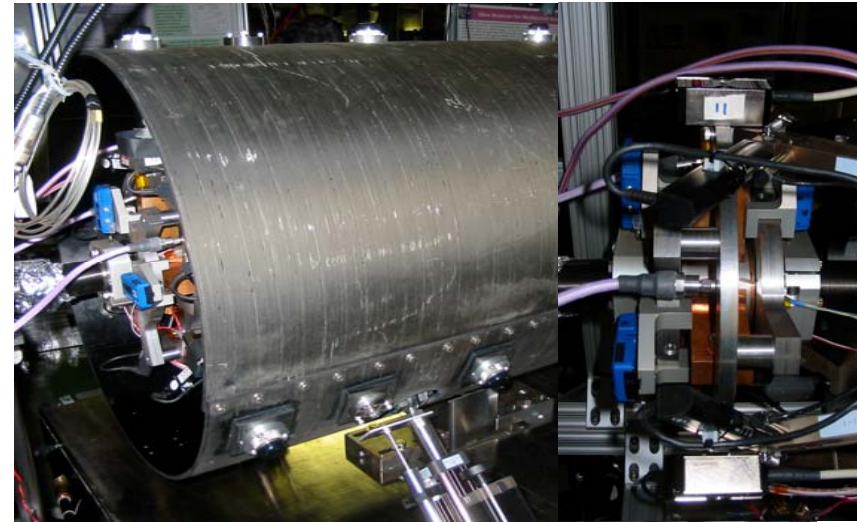
NanoBPM program in ATF2

- **Resolution performance verified**
  - Vertical 15.6nm
  - Angular vertical 2.1 μrad
  - Stability over multiple hours

- **Longer term plans**
  - Calibration systems
  - Long term stability
  - Full exploitation of BPM monitoring systems
  - Electronics noise not dominant

- **Multibunch**
  - ILC like beam structure
  - Extraction of beam positions
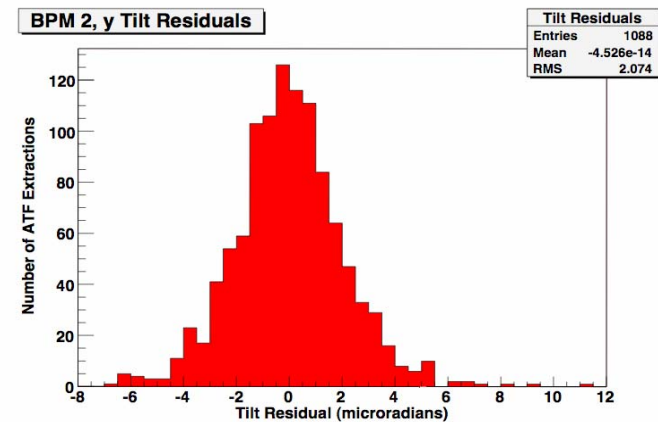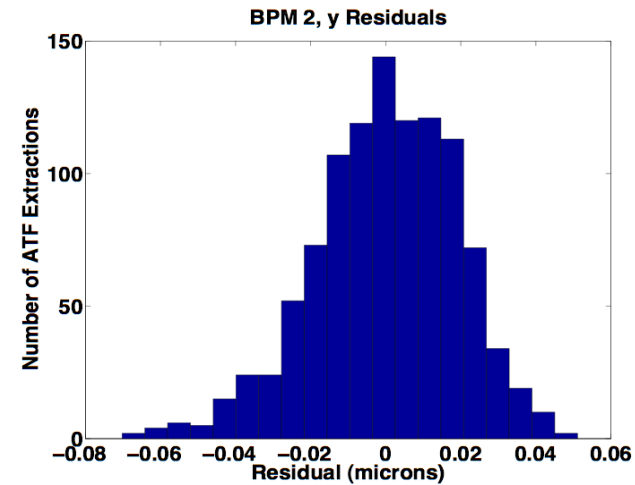
ATF nanoBPM program

- Operation 2007/08
  - Attempt to reach electronics thermal noise limit
  - Demonstrate multibunch operation
    - Essential for ATF2 Q-BPM operation with ILC train
  - Test stand for ATF2 electronics and analysis
  - Diagnostics of existing slow systematic drifts of extracted beam
    - Magnet cooling water
    - Extraction
    - Dispersion correction
  - Full monitoring of BPM system
    - Electronics (ATF2 electronics)
    - Mechanical (nanoGrid)
  - Refactor nanoBPM into Q-BPM like system (i.e. test readout and algorithms required for ATF2 during ATF operation)

NanoBPM location in ATF2

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

- Either location A or B reasonable for nanoBPM
  - Optics as yet not checked
  - Low dispersion important
- Proximity to laserwire IP could be beneficial to subtract beam motion from laserwire measurements
- Cross check of ATF Q-BPMs
- Independent test stand, not essential to ATF2 operation but similar enough to Q-BPMs

Installation schedule

- Not overly complicated
  - Not essential for ATF2 commissioning
  - Complete system might be able to move without complete disassembly
    - Restraint of flexures
      - Between space-frame and carbon metrology tube
      - Individual BPM hexapod flexures
    - Move complete system including table?
- Disassemble and reassemble at start of summer shutdown 08,
  - Single operation (one to two weeks)
  - Require input and personnel from LLNL and SLAC
  - Assistance from UK