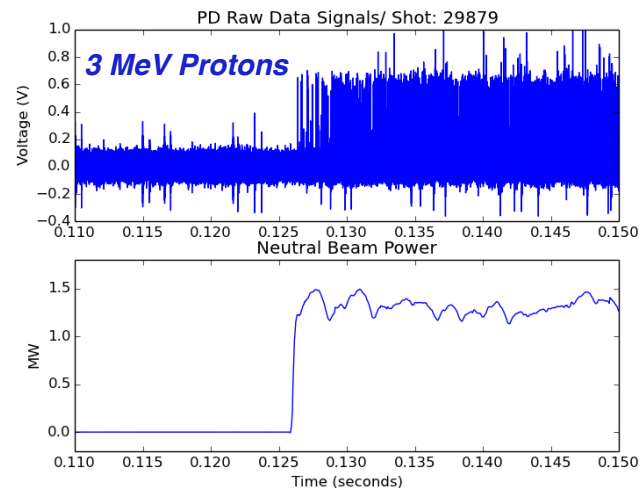
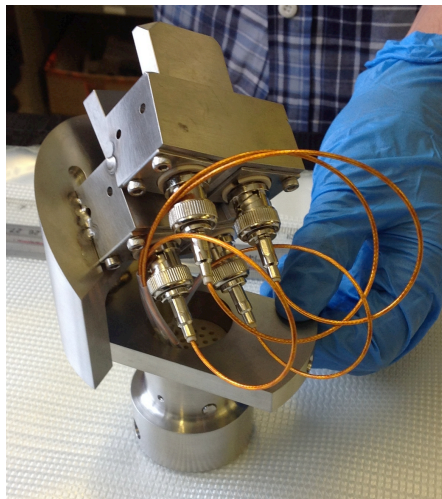


## Fusion source profile measurement with the proton detector

**Werner U. Boeglin**  
*Ramona Perez, Alexander Netepenko, FIU*  
*D.S. Darrow PPPL*

*Coll of Wm & Mary*  
*Columbia U*  
*CompX*  
*General Atomics*  
*FIU*  
*INL*  
*Johns Hopkins U*  
*LANL*  
*LLNL*  
*Lodestar*  
*MIT*  
*Lehigh U*  
*Nova Photonics*  
*ORNL*  
*PPPL*  
*Princeton U*  
*Purdue U*  
*SNL*  
*Think Tank, Inc.*  
*UC Davis*  
*UC Irvine*  
*UCLA*  
*UCSD*  
*U Colorado*  
*U Illinois*  
*U Maryland*  
*U Rochester*  
*U Tennessee*  
*U Tulsa*  
*U Washington*  
*U Wisconsin*  
*X Science LLC*

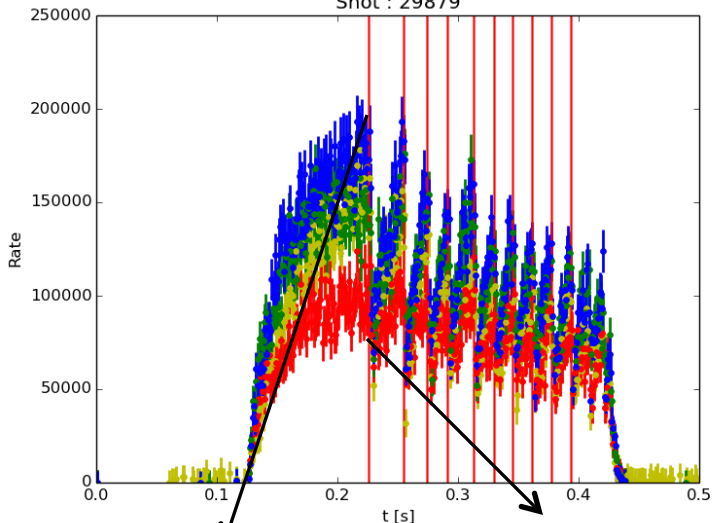


*Culham Sci Ctr*  
*York U*  
*Chubu U*  
*Fukui U*  
*Hiroshima U*  
*Hyogo U*  
*Kyoto U*  
*Kyushu U*  
*Kyushu Tokai U*  
*NIFS*  
*Niigata U*  
*U Tokyo*  
*JAEA*  
*Inst for Nucl Res, Kiev*  
*Ioffe Inst*  
*TRINITI*  
*Chonbuk Natl U*  
*NFRI*  
*KAIST*  
*POSTECH*  
*Seoul Natl U*  
*ASIPP*  
*CIEMAT*  
*FOM Inst DIFFER*  
*ENEA, Frascati*  
*CEA, Cadarache*  
*IPP, Jülich*  
*IPP, Garching*  
*ASCR, Czech Rep*

# First 3 MeV Proton Results from MAST

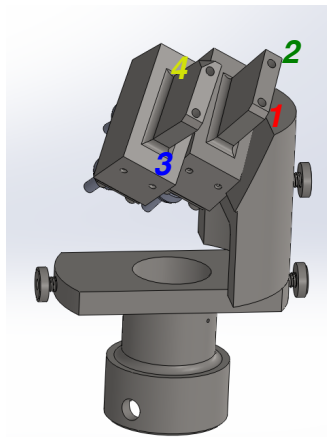
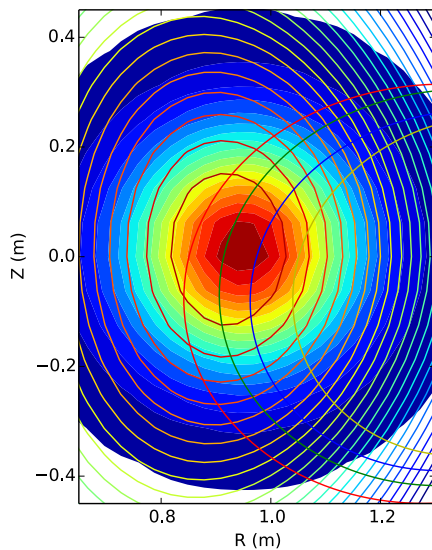
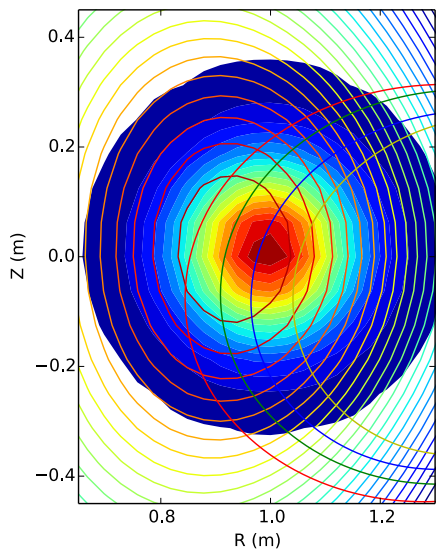
## SAW TOOTH

Shot : 29879



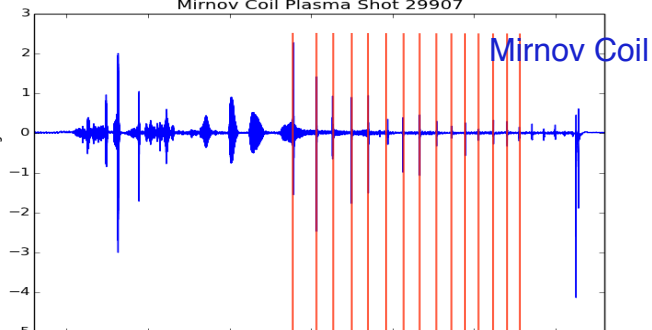
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./MAST\_efit/g029879.00230.dat

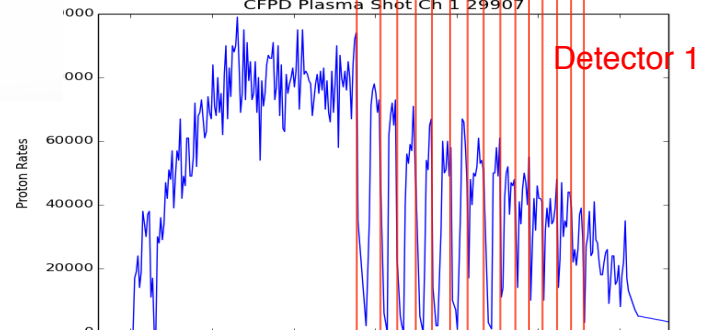


## SAW TOOTH (?)

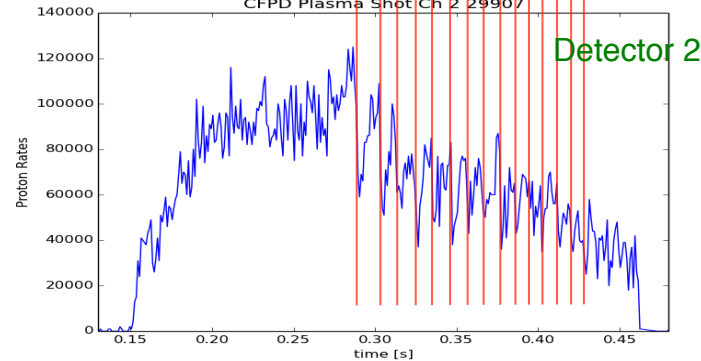
Mirnov Coil Plasma Shot 29907



CFPD Plasma Shot Ch 1 29907



CFPD Plasma Shot Ch 2 29907



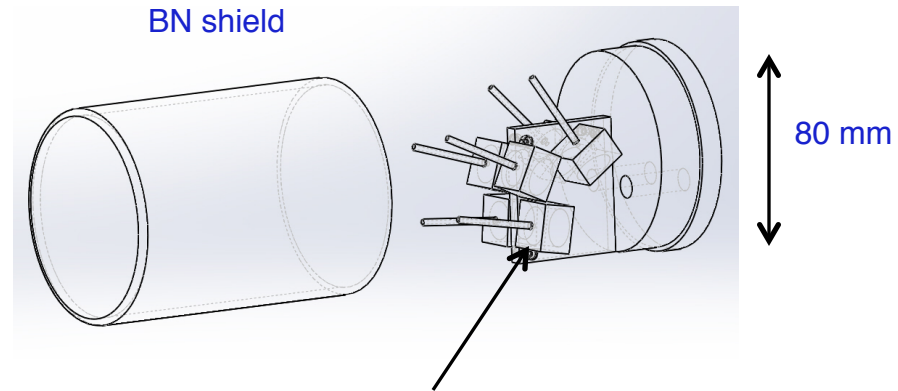
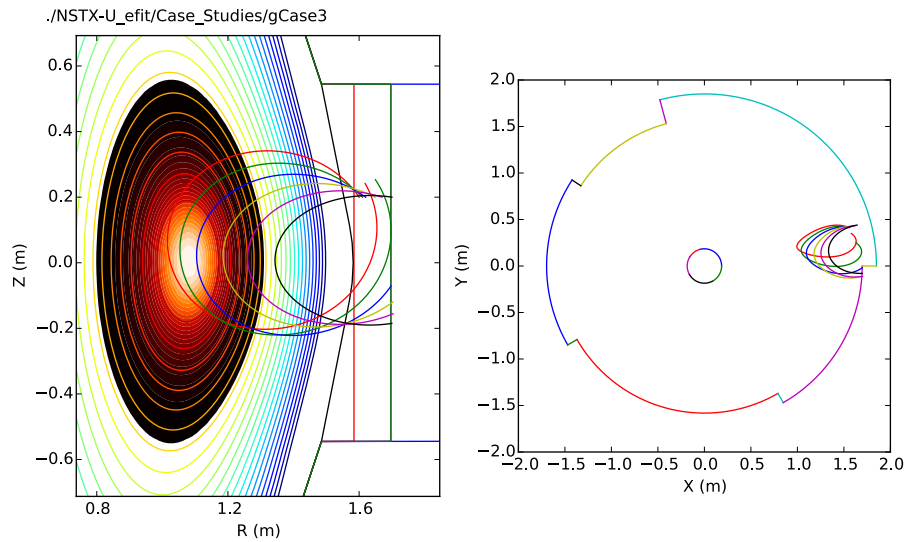
Detector 1

Detector 2

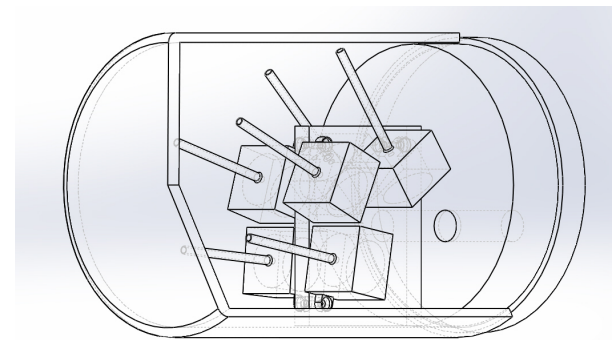
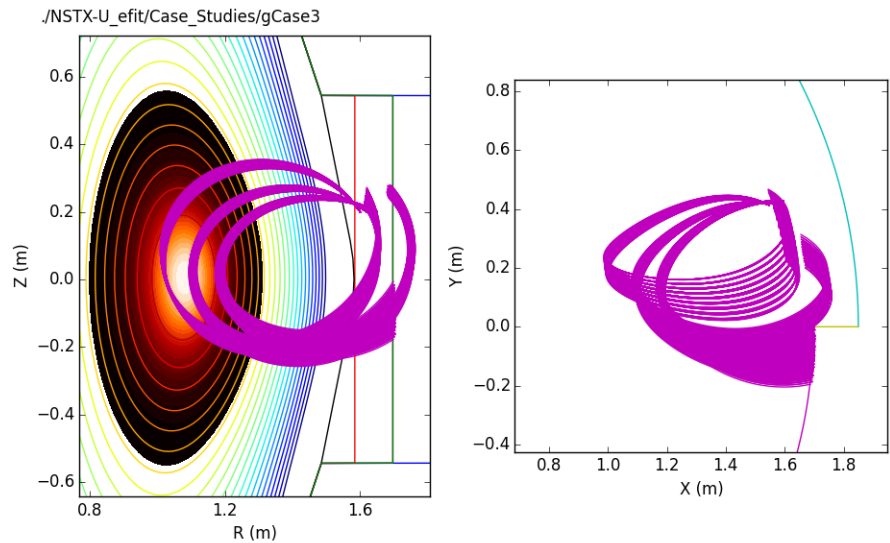
Detector 3

Detector 4

# 6 Channel Proton Detector Array for NSTX-U



Individual detector/collimator combinations



# Plans for 2015

- Installation of new proton detector array
  - Conceptual design review : end of March
  - Installation: August/September 2015
  - 6 detectors
  - Radial and rotational movement
- Energy resolution, rate capabilities
  - Perform signal noise studies, optimize energy resolution (100keV should be feasible)
  - Perform rate studies: tested with accelerator: practical limit 450kHz with reduced energy resolution

# Measurements at NSTX-U

- Proton Detector Commissioning
  - Objective : extract first fusion rate profile data.
  - Need a range of plasma currents, toroidal fields, NB power and detector orientations
  - Preferably quiescent plasmas, with as many other fast ion diagnostics as possible also taking data.
  - Repeated shots for probe scans.
  - Comparison to Neutron data other FI data and TRANSP predictions
  - Measurement during MHD activity
  - PD planned to be ready in later half of campaign.
- Some data can be taken parasitically