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Instrumentation and ARRA Funding

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(Presented by Patricia Fernandez – XSD-BTS)

APS/Users Monthly Operations Meeting

July 29, 2009

Background

- Response to DOE request for ARRA funds*
 - Front end and insertion devices upgrade \$3,600K
 - Detectors and new effort \$2,000K (First installment)
\$2,300K (Second)
-
- Total: \$7,900K**

*Stringent reporting and milestone requirements

1. Front End and Insertion Devices Upgrade

- **Canted Front-End and New Undulators for GSE-CARS:**

GSE CARS VC & IDs (2.9 cm and 3.6 cm periods):	\$772K
New effort	\$137K
GSE CARS canted front end:	\$572K
Sub-total – GSE CARS:	\$1,484K

- **Canted Front-End and New Undulators for Sector 34-ID:**

Sector 34 VC & IDs (one additional undulator A):	\$222K
Sector 34 canted front end:	\$575K
Sub-total – Sector 34:	\$797K

- **Canted Front-End and New Undulators for HP-CAT ***

HP-CAT VC & IDs:	\$772K
HP-CAT canted front end:	\$572K
Sub-total – HP-CAT:	\$1,347K

TOTAL **\$3,628K**

Front End and Insertion Devices Installation

- **Schedule being developed**
- **The earliest FE installation to begin in September 2010**
 - Takes ~ 1 year to procure components
- **Completion expected in 2011**
 - Assuming one FE installation per shutdown

2. Detector Pool: Quick Glance

- **GE a-Silicon Flat Panel (1) (>100%)**
- **PerkinElmer a-Si Flat Panel (1) (>100%)**
- **Pilatus 100K Pixel Array Detector (2) (>100%)**
- **SII 4-element Vortex SDD (2) (>100%)**
- **mar165 CCD (3) (>100%)**
- ~~SII Vortex Single element SDD (4) (75%)~~
- Mar 345 Image Plate (2) (75%)
- Photometrics CoolSnap & Zeiss Optics (2) (75%)
- APS-in-house Avalanche Photodiodes (APDs) (4)
- High Speed Sarnoff CCD & Zeiss Optics (1)
- Ketek Silicon Drift Diode (6)
- Single & multi-element Germanium (3)
- Fuji BAS-2500 Image Plate Scanner (1)
- Bruker 6500 CCD Detector (1)
- Others: Cyberstar NaI & YAP, Xradia Resolution pattern, calibrated PIN diode, etc.
- ~300 requests per year from entire APS community
- *The Detector Pool is grateful to DND-CAT, GSE-CARS, Bio-CAT, Bio-CARS, and HP-CAT for letting them borrow various detectors (mar165, mar345, Pilatus, and 4-element SDDs)*



GE a-Si Flat Panel

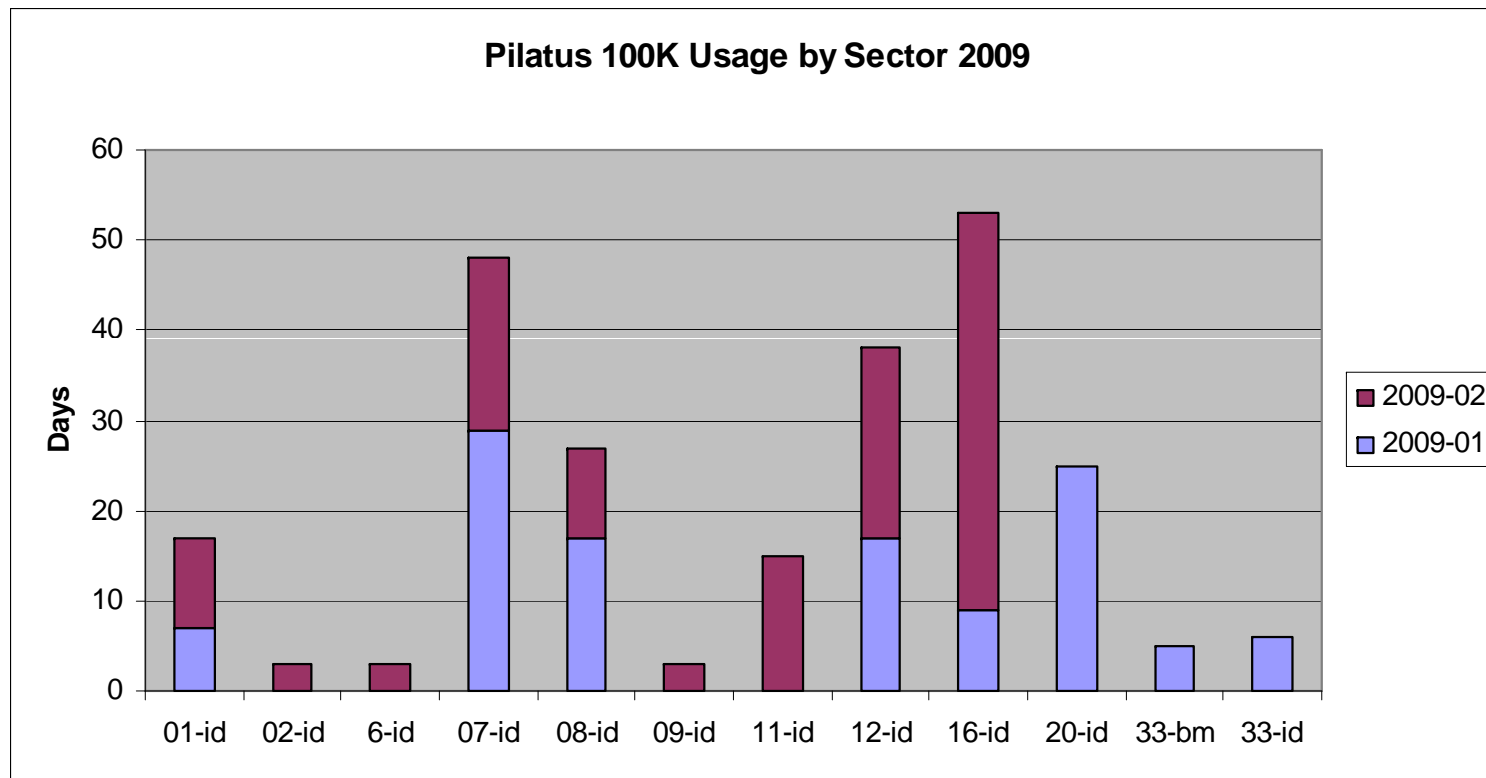


Pilatus 100K



4-element Vortex SDD

Pilatus 100K in Highest Demand



243 days of usage for runs 2009-01 and 2009-02 combined

Other Considerations

First Installment - \$2,000K

- Maximum scientific impact
- Consistent with the APS Renewal direction

List of Detectors:

- **Pilatus 100K**
- **SII 4-element Vortex detectors (2)**
- **Pilatus 2M**
- **Pilatus 1M**
- **New hire for detector software support (AES-BCDA)**

More Detectors and Support

Second Installment - \$2,300K (not received yet)

- **Additional Pilatus 100K (2)**
- **Additional SII 4-element Vortex detectors (3)**
- **Large area (Perkin-Elmer) detectors (5) ***
- **CCD detector (Shimadzu) for ultrafast imaging**
- **Fast CCD for nanoscale dynamics (LBL-APS collaboration) ***
- **Array of CZT detectors (Amptek/Hamamatsu) ***
- **Additional hire for detector support (XSD-BTS)**

Summary

- **ARRA funds (\$3.6M) for upgrade of three canted front ends received**
 - GSE-CARS, 34-ID, and HP-CAT
 - Installation schedule in development
 - Target for completion: 2011
- **First installment of ARRA funds (\$2.0M) for detectors and support received**
 - Five detectors selected
 - New hire PD for detector software support ready to be posted
- **Waiting for the second installment of ARRA funds (\$2.3M)**
 - Reviewing the list of detectors
 - New hire PD for detector support in preparation