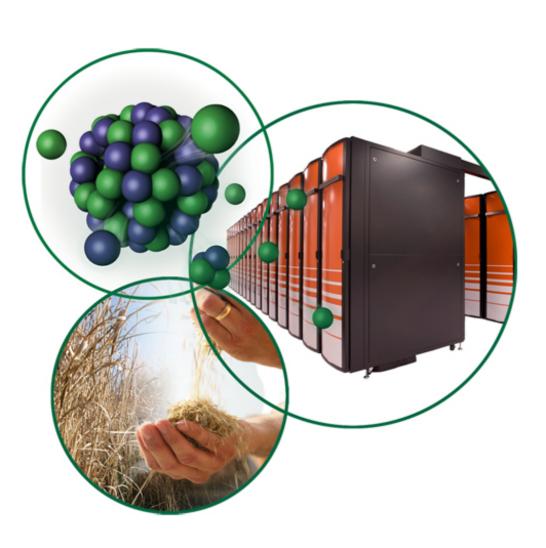
# XAL Status Report Spring, 2008



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### What is XAL?

- Development environment for creating accelerator physics applications, scripts and services
  - Control room applications
  - Analysis applications
- Application framework
- Toolbox of Java packages
- Ant based build system (independent of IDE)
- Developed initially for the Spallation Neutron Source (SNS)
- Used in commissioning and running SNS



### Collaboration

- Source Forge Project: xaldev
  - -http://sourceforge.net/projects/xaldev
  - Source code managed using Subversion
- Dozens of developers among several sites
  - SNS, SLAC, BNL, JPARC, GANIL and others
- Contact us to participate



### **Development Requirements**

- Java JDK J2SE 5
- Ant 1.7
- Your favorite editor or IDE
- Subversion client (if you want to share code)

## Sample from Over Four Dozen Applications

- Orbit Correction
- Knobs
- Optics Measurement and Matching
- Quadrupole Shaking for alignment measurement
- Snapshot and Restoring conditions
- RF Cavity phase and amplitude setting
- Logging machine conditions
- Database browsing
- Virtual Accelerator



### **Toolbox**

- Channel Access API abstraction wrapping JCA
- Correlator for correlating channel access events by time stamp
- Optimization
- Data Adaptor for object archiving
- Plotting
- Statistics Package
- Math packages



## **Accelerator Physics**

- Accelerator device hierarchy
  - Object representation of accelerator hierarchy
  - Relational database -> XML -> object tree
- Online Model
  - Models the accelerator beam dynamics
  - Performs twiss function generation
  - Synchronizes with live machine, design or historical machine snapshots



## **Application Development**

- Application Framework
  - Consistent look and feel
  - Document based applications
  - Pre-baked modern application features
- Bricks GUI Builder
  - Rapid visual development of user interfaces
  - Model-View-Controller compliant
  - Integrates with application framework
  - Supports compile-free application development with scripts (jython or jruby)



### **Recent Core Developments**

- Adopt JRuby for scripting
  - http://jruby.codehaus.org
  - more powerful alternative to Jython
- Menu and toolbar items gain standard icons
- Automatic Copy, Cut and Paste support for any control with drag and drop support
- Bricks user interface builder
- Support for site specific devices



## **Recent Applications and Scripts**

- Magnet Cycling
- Ring Tune Monitor
- Loss Viewer II
- RF Simulator
- Quad Shaker
- Lab Book



### **Current Development Efforts**

- Significant improvements to the Online Model
- Support for rolled magnets and alignment errors
- Distributed agent based services
- Configuration Management
- Support for full featured scripted applications
- Generate both web and Java user interfaces from the same Bricks description
- Adding new features to existing applications
- Bug fixing



### XAL 2

- Fresh effort
  - Borrow XAL technology and concepts that work
  - Rewrite code from scratch as necessary
  - Parallel to XAL effort
- Cross Site compatibility
  - Work closely with collaborators to design XAL for compatibility across laboratories
- Long Term development (no timeline)
- Source Forge Project: xal2
  - -http://sourceforge.net/projects/xal2
- Chris Allen is leading this effort



#### **XAL Course**

- USPAS course on "Control Room Accelerator Physics" is being offered
  - Will use XAL extensively
  - **–June 23 27, 2008**
  - -http://uspas.fnal.gov/programs/UMD/ ControlRoomAccelPhys.html
  - -http://uspas.fnal.gov/programs/umd.html

