Acquaman

Scientific Software as the Beamline Interface

```
100
101  UserInterface::collectData(){
102
103          previousData_ = acquaman_->lastRun();
104
105          if(userScience_->isEnabled()){
106                  acquaman_->doScience();
107          }
108
109  }
110
```

David Chevrier - CAP - June 15, 2015
Interim Systems Technology Manager
Canadian Light Source

Road Map

- The five W's
  - (I'm hoping not to talk too much about "how")
- Explore the pillars of Acquaman development
  - Database, Visualization, Workflow
- Switch the perspective
  - Managing a modular, scalable, and flexible framework
  - Case Studies: IDEAS & SXRMB

who/what/when/where

- What is an Acquaman?
  - **Acqu**isition and Data **Man**agement
  - Framework & Program

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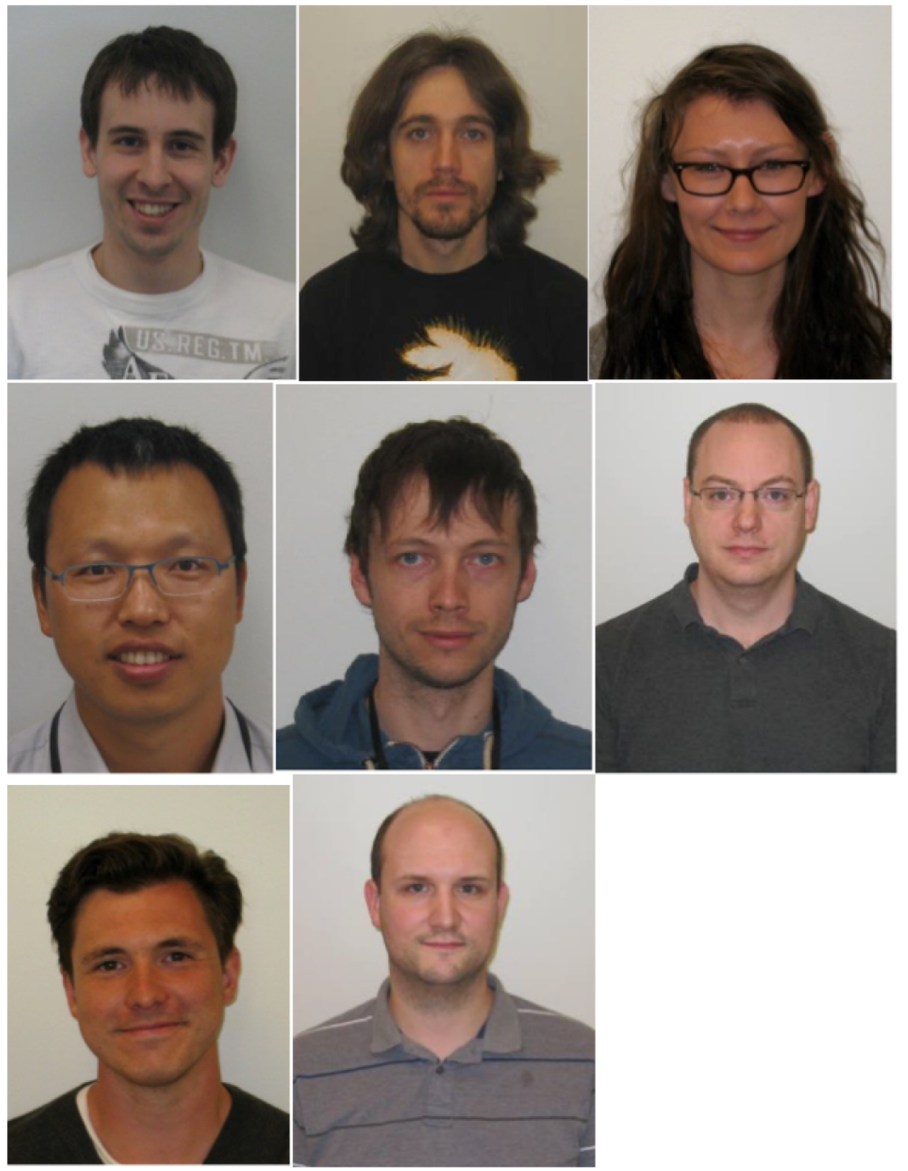
  - Darren Hunter, Jessie Helfrich, Sheldon Liu, Iain Workman, David Muir, David Leacock, David Beauregard



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  - 1st Deployment Spring 2011
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- Where is Acquaman?
  - SGM, VESPERS, REIXS (original)
  - REIXS, IDEAS (~2014)
  - SXRMB, BioXAS Side (2015)
  - BioXAS Main & Imaging (~2016)
  - PGM & HXMA (?)

Why Develop Acquaman?

- Letting users focus on Science
  - Experiment tool *not* a beamline interface
  - One-stop Shop
  - Pleasant and efficient

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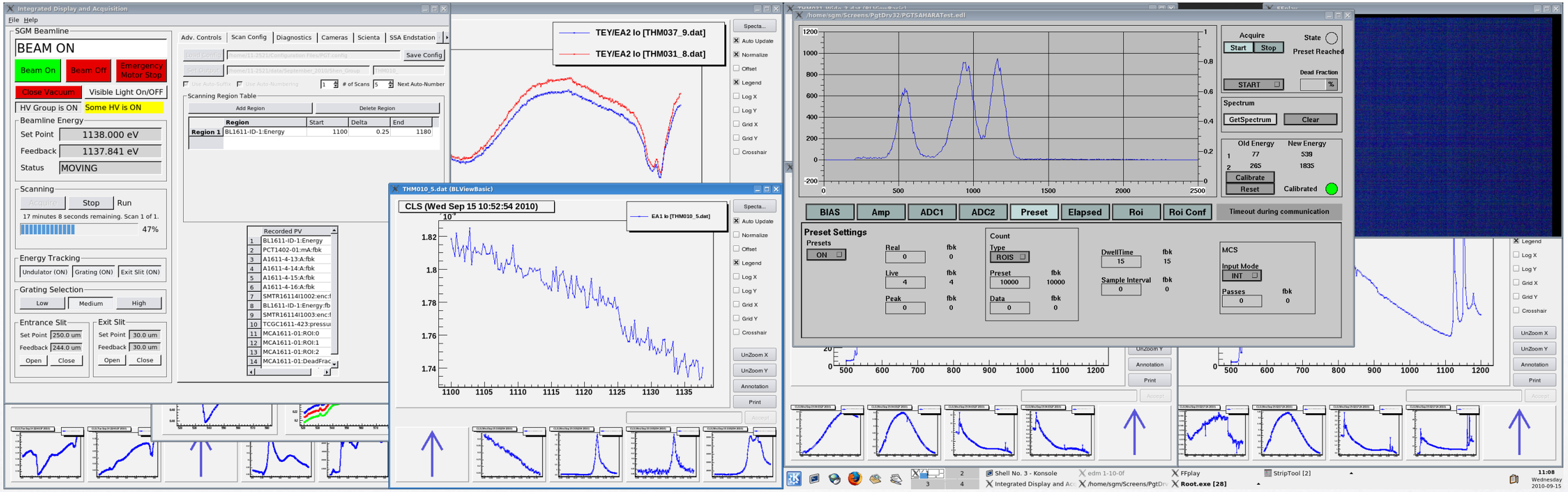

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- L
  - E
  - C
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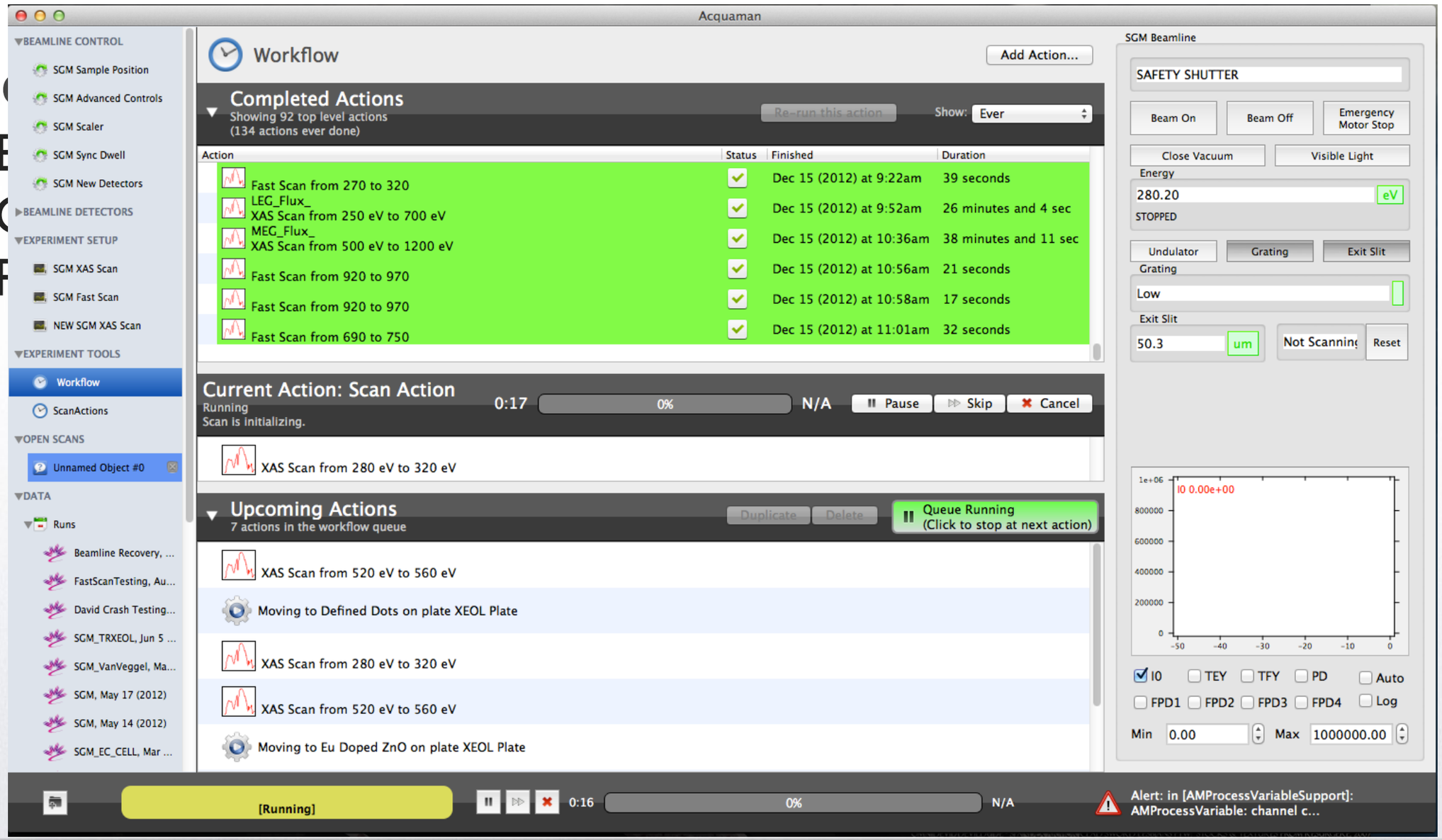

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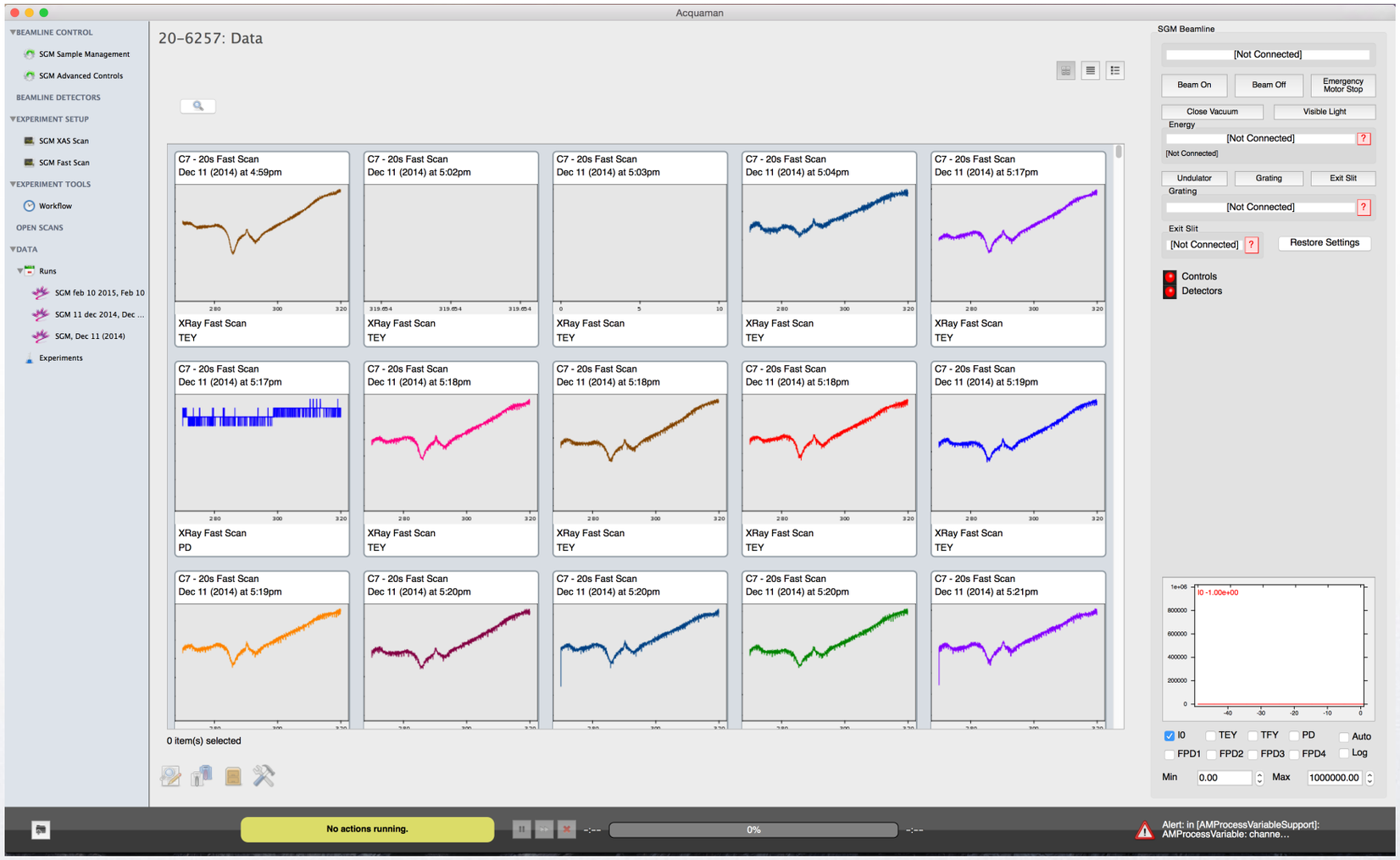
- Leveraging a framework
  - Started with Qt, SQL, git, github, OpenGL
  - Now AM is a framework

Database

- What does it do?
  - Long term storage
  - Sorting
  - Persistence



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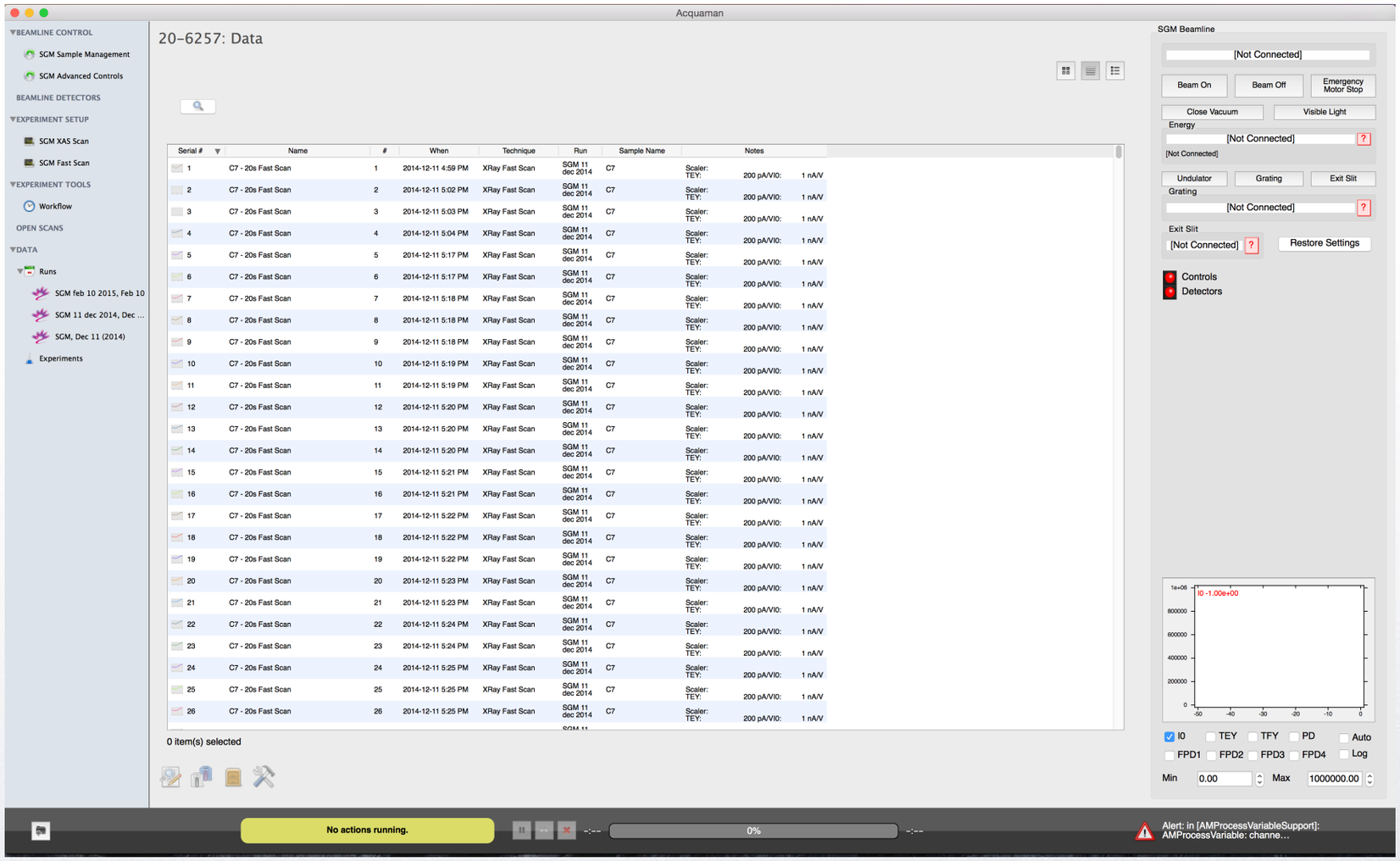

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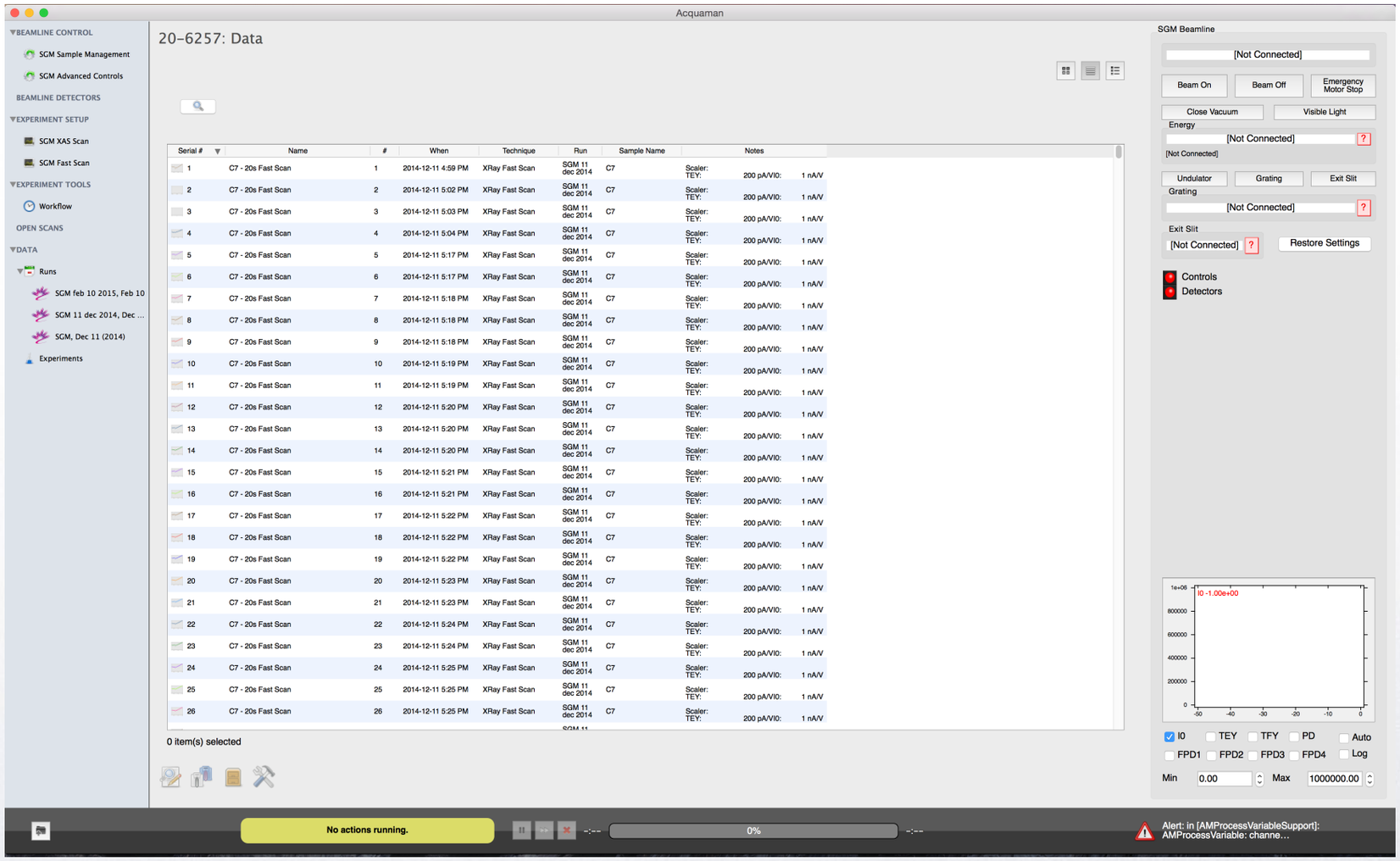
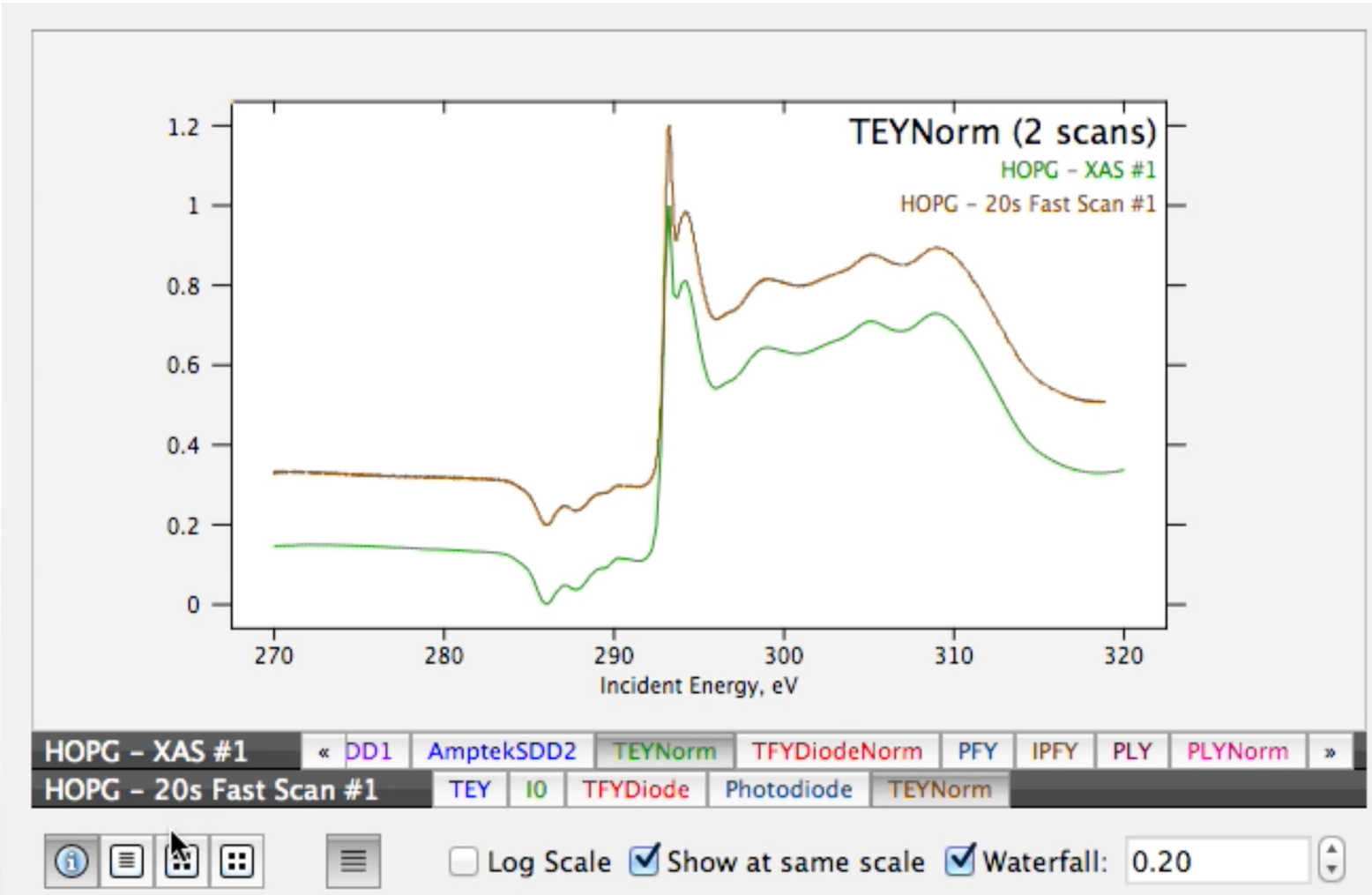
- What do you get?
  - Convenience
  - Confidence



Visualization

- What does it do?
  - View live or reloaded data
  - Line scans or maps *(or both)*
  - Compare within a scan or between scans



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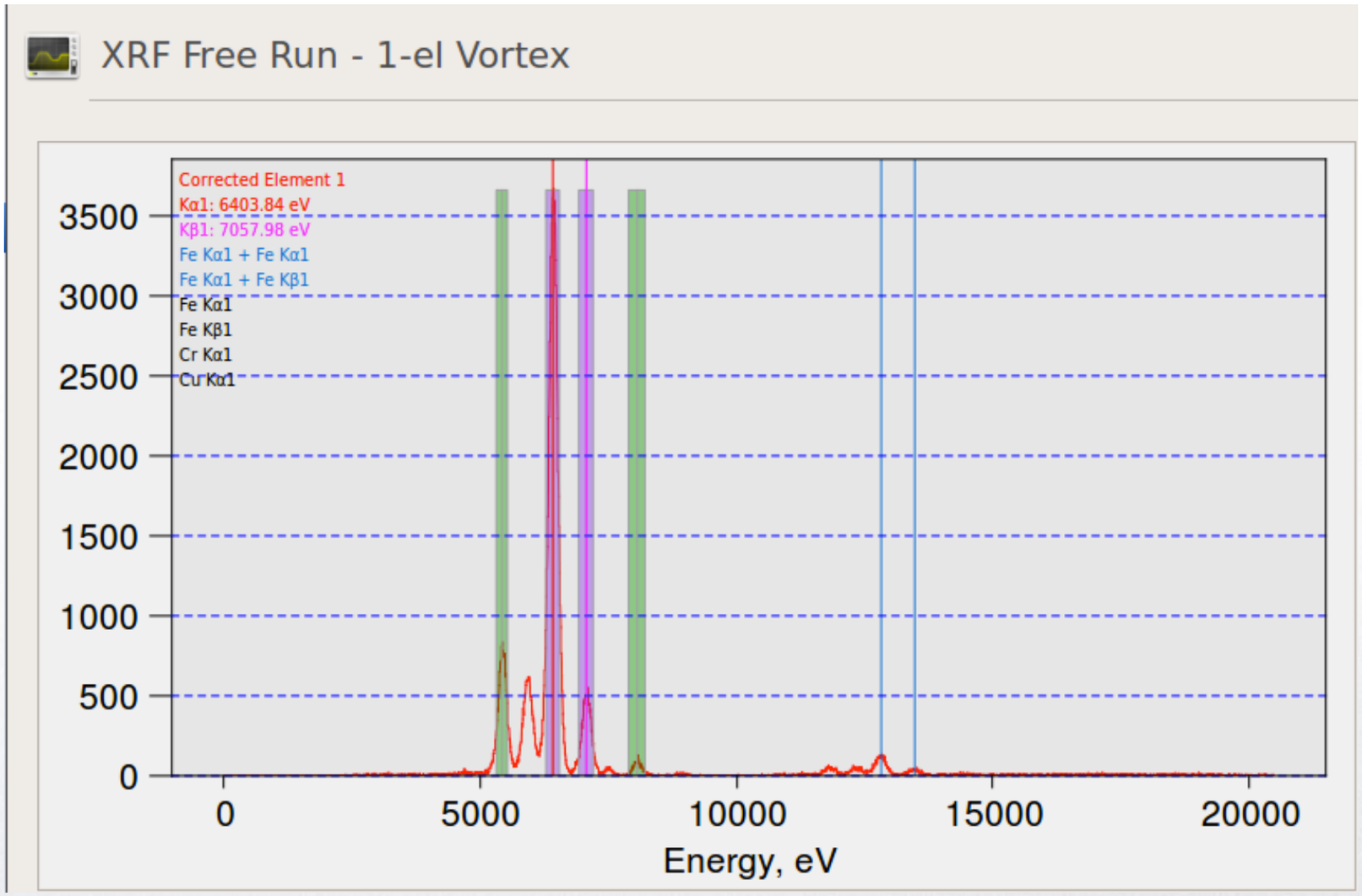

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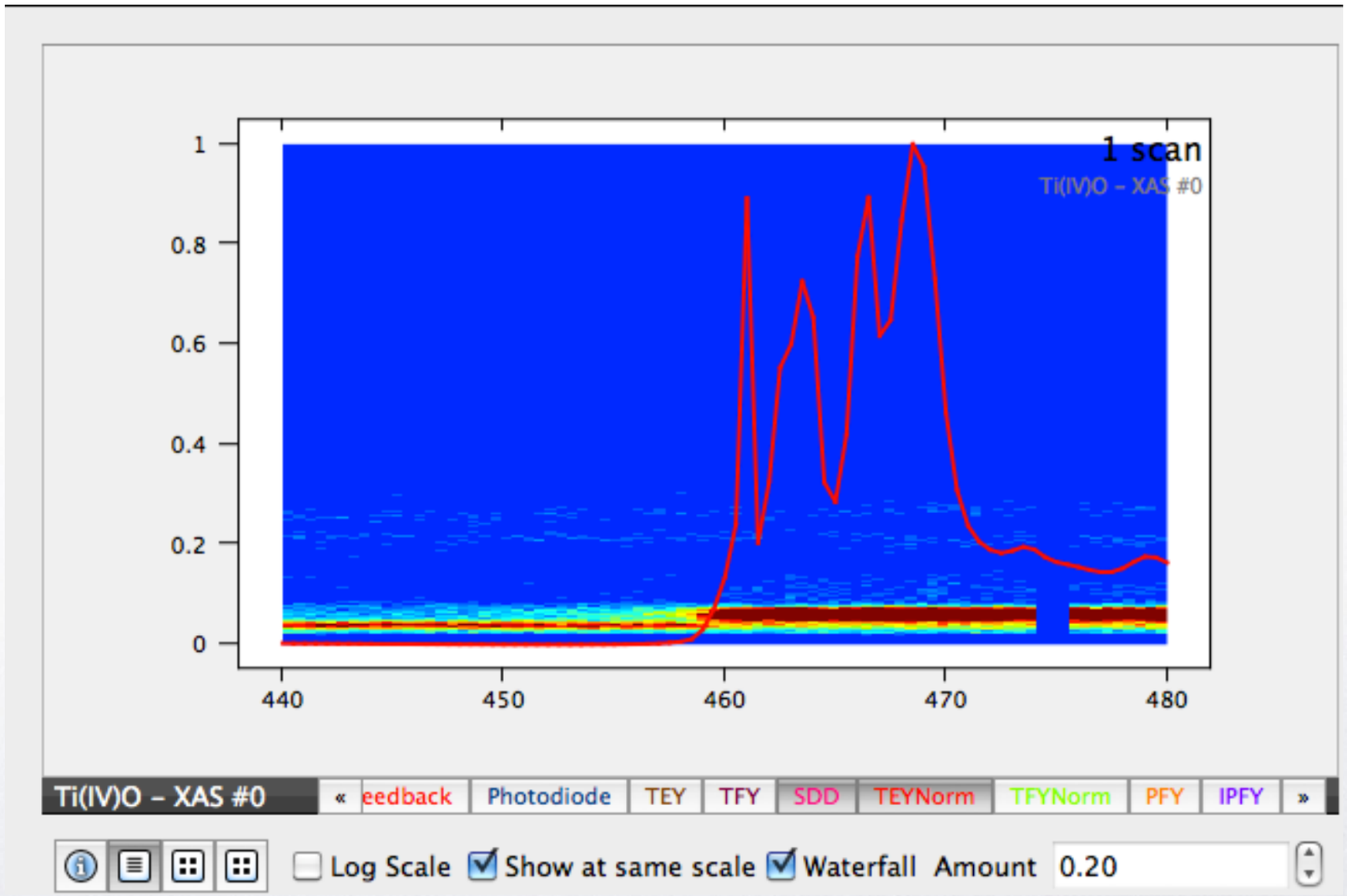

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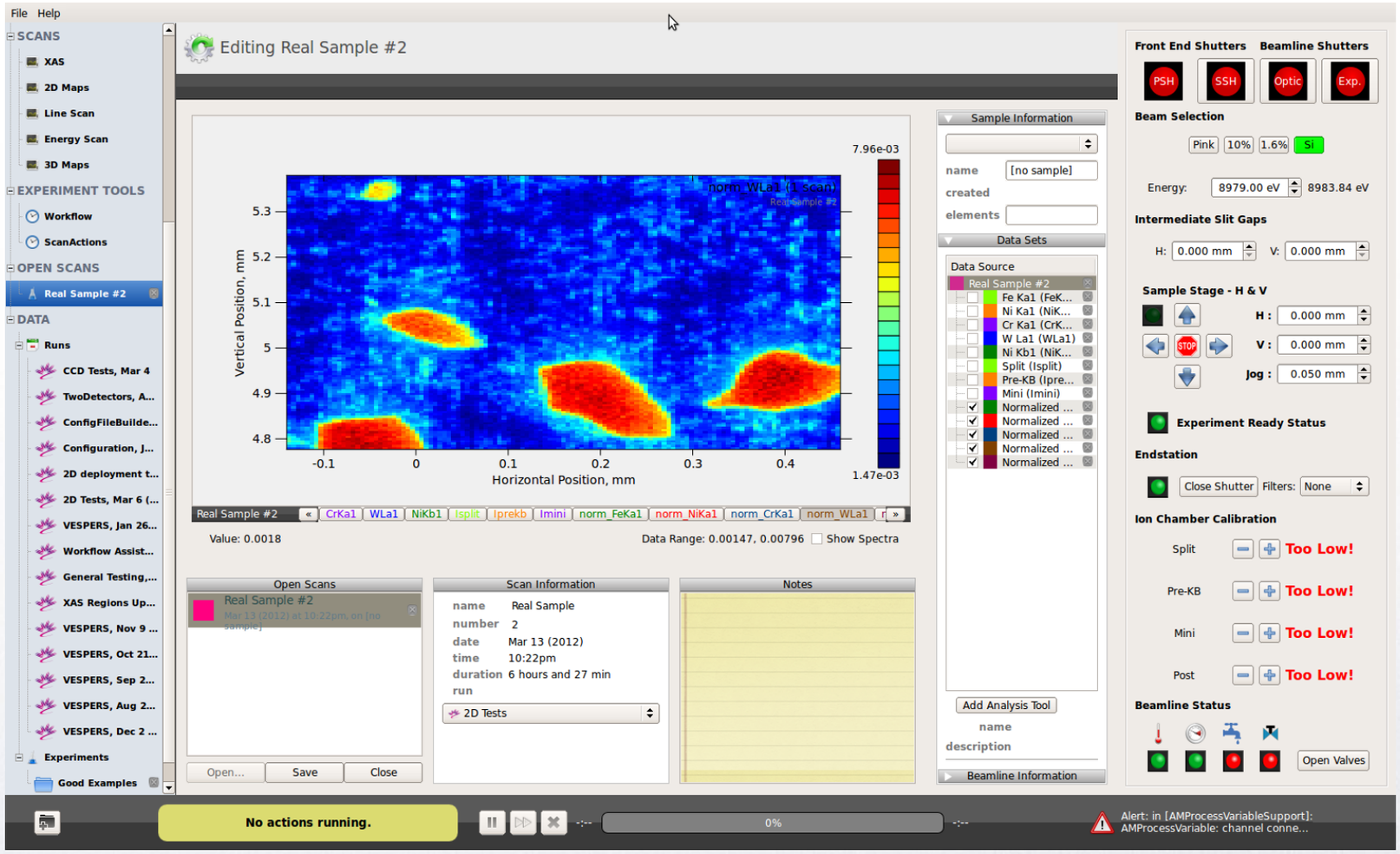

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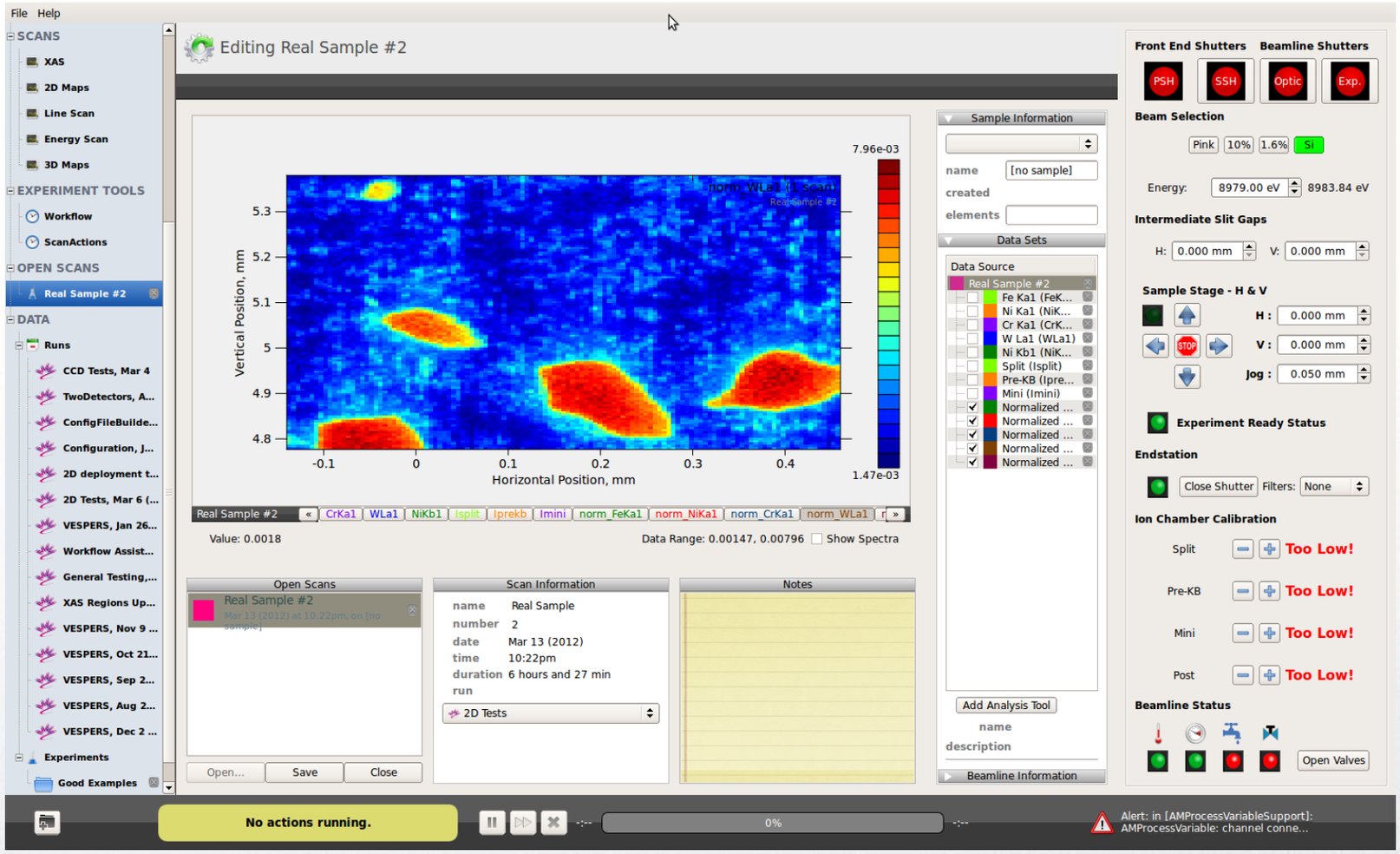

If you have Visualization ...

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  - Simple arithmetic
  - Simple image processing
  - Extensibility
  - *(Doesn't) "Out-Igor" Igor*

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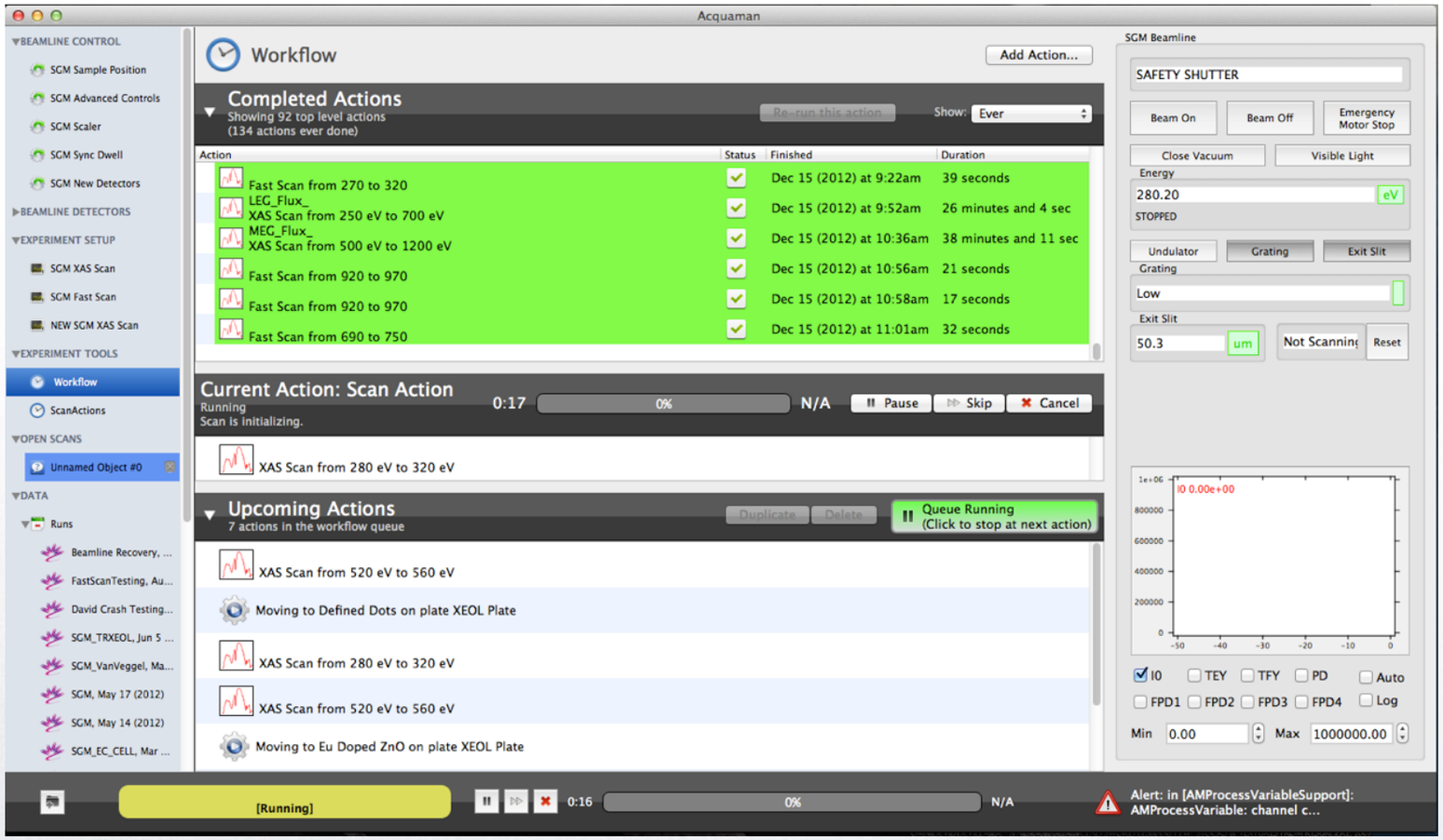
  - Configurability

Workflow



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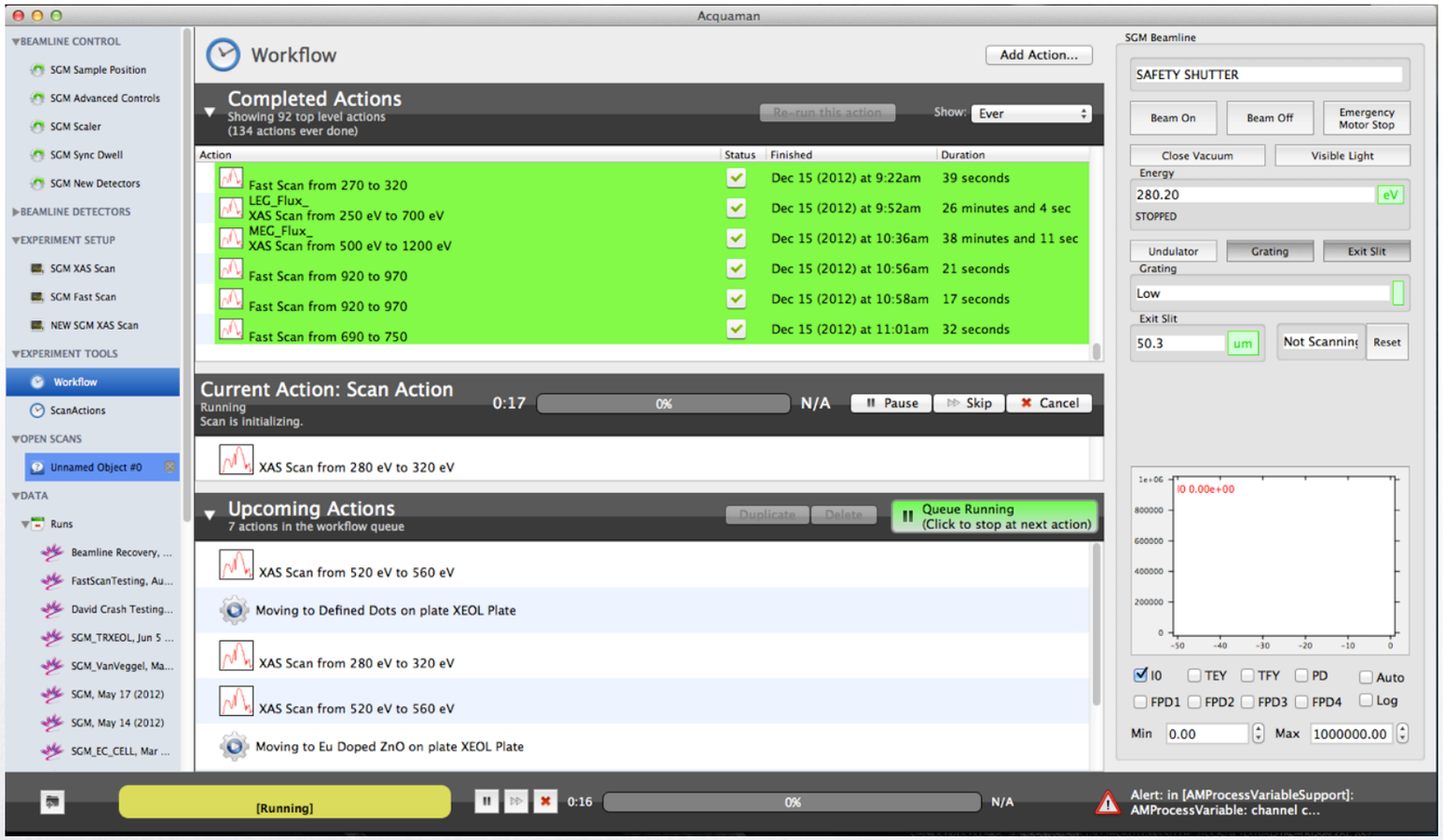

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- What do you get?
  - "Brew Mode"
  - Reduce "4 am" errors

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- As a code framework
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- As a development community
  - Foster a group environment
  - Invest in mentorship
  - Develop good practices
  - Encourage new ideas

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  - Outcome: functioning XAS scans & interface & Ketek ~1600 lines

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  - P 1: beamline & 2D mapping by Darren & David C ~4 days 5500 lines
  - P 2: vacuum & ambient upgrade by Darren & Sheldon ~7 days 5000 lines

Conclusion

- Acquaman is purpose-built to help users
  - Focus on making the user's life easy, comfortable, and maybe even fun
- Acquaman is focused on user requirements
  - Data, visualization, scans
  - Optimized to support required techniques (XAS, mapping)
  - Specific customizations can grow into new general tools
- Acquaman keeps growing
  - Support more user needs
  - Support more beamline staff needs
  - Make it as easy as possible for programmers

Questions