



Phase 1 - New 2D detector, x6 efficiency, high resolution more often

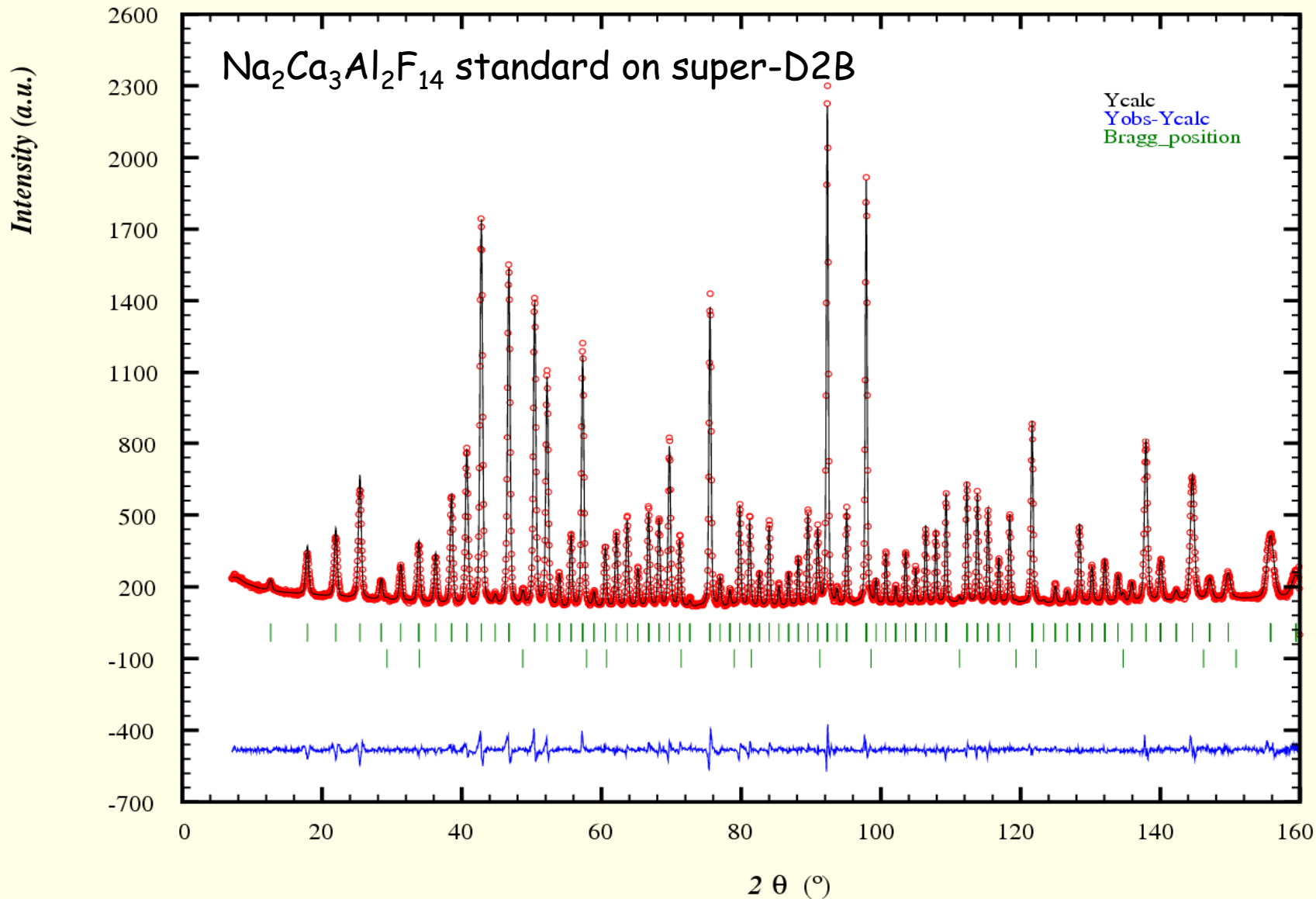
Completed and tested according to timescale and cost

Phase 2 - Primary Spectrometer - Objectives

- 1) To rebuild the monochromator mechanics, primary collimation and filter system to ensure greater stability, easier access to the monochromator, and improved efficiency.
- 2) To rebuild the sample table mechanics & provide a larger choice of wavelengths, especially 3.152\AA from Ge[311], and eventually 6.3\AA from Ge[111], to extend high resolution to longer d-spacings.

Phase 3 - Sample Environment

- 1) To provide a larger choice of sample environments, faster changes of samples and sample environments...





Objective 2 - To provide a larger choice of wavelengths

- a) -The D2B monochromator mechanics is constrained to a very small space
-Access is only possible from the top of the beam-line casemat
-The 22-year old primary collimators have degraded with time
- b) The limited space available has meant that only a single monochromator can be accommodated - *Ge[hkk]* bent wafer technique.
- c) The *Ge[hkk]* monochromator has the advantage that a number of different wavelengths can be obtained:

[hkk] plane	Wavelength
[557]	1.051 Å yes
[337]	1.277 Å yes
[551]	1.464 Å yes
[335]	1.594 Å yes
[331]	2.398 Å yes
[113]	3.152 Å no
[111]	6.3 Å yes?



Progress with objective 2

- The D2B monochromator mechanics has been rebuilt.
- New 5' and 10' collimators have been installed.
- AZ-Systemes proposal for new diffractometer base ~100K€
- Judged too expensive - new proposal for 55K€ to be discussed
- Luc Didier prefers in-house solution - to be discussed next week
- It appears impossible to find space for a monochromator changer.
- A new type of graphite filter was proposed to eliminate harmonic contamination by reflecting those wavelengths out of the monochromated beam - tests show this not feasible.



New Monochromator Mechanics and Primary Collimators





Objective 3 - To provide a larger choice of sample environments

- Almost all experiments need increasingly complex sample environments. (See the list of current UK commissioning experiments).
- New pulsed tube refrigerator (5K-300K) - working routinely.
- Temperature insert for refrigerator -> 300C -working routinely.
- New cryomagnet (7 Tesla) at low temperatures (arrives 20th July)
- New high pressure cell at low temperatures (to be tested on D2B).
- Dilution refrigerator insert ~100 mK (1st test experiment 2 August)
- New high temperature furnace, controller, controlled atmosphere.



Summary of proposed work July 2006 - June 2007

- July 2006: Tests on D2B of the old D1A hot-pressed Ge.
- July 2006 - July 2007: Provided the tests indicate that a new mono. is feasible, production of a new 300x50x10mm Ge[hhk] monochromator. Full Cost: 46 K€.
- July 2006 - Jan 2007: Construction of new sample table mechanics.
- July 2006 - Oct 2006: Growth of high quality Ge single crystals
- Nov 2006 - Dec 2006: Alignment and cutting of Ge crystals
- Jan 2007 - April 2007: Hot-pressing of Ge crystals
- April 2007 - July 2007: Alignment and assembly and tests.