DRACULA

Diffractometer for Rapid ACquistion

Can ILL compete with the American SNS ?

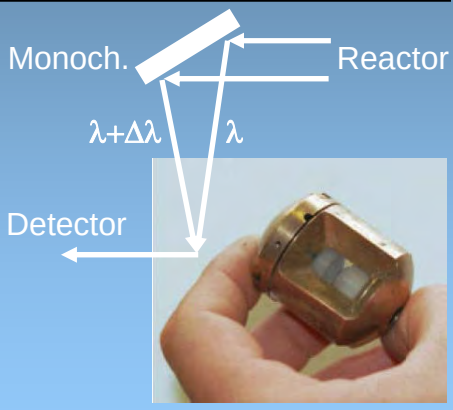
	D20	GEM	DRAC	SNS
time averaged sample flux	$5x10^7$	$\sim 2x10^6$	$\sim 10^8$	$\sim 2.5x10^7$
detector solid angle (sr)	0.27	4.0	1.5	3.0
efficiency	1.7	1	18	9

"Efficiency" = sample flux * detector (sr)

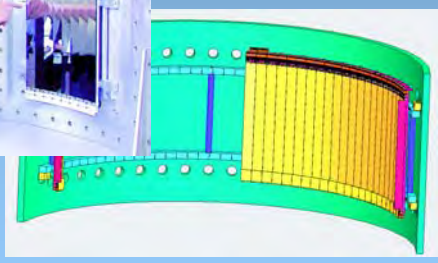
Comparison of TOF & CW Diffractometers

Shelter Island (1984) N.I.M. B12, 525

Jorgensen, J.D., Cox, D.E., Hewat, A.W., Yelon, W.B.



2D PSD prototype



D19 detector

- Large focussing D2B/D20 monochromators
- Reactors provide high time-averaged flux
- Wavelength band ~1% for resolution ~0.1%

- Reactors now have large 2D detectors
- D19-type PSD can cover $160^0 x 32^0 = 1.5sr$
- Very small samples eg high pressure

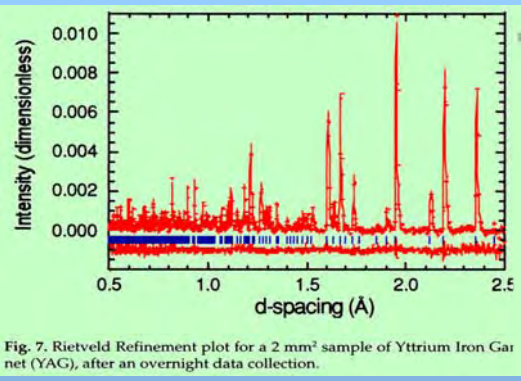
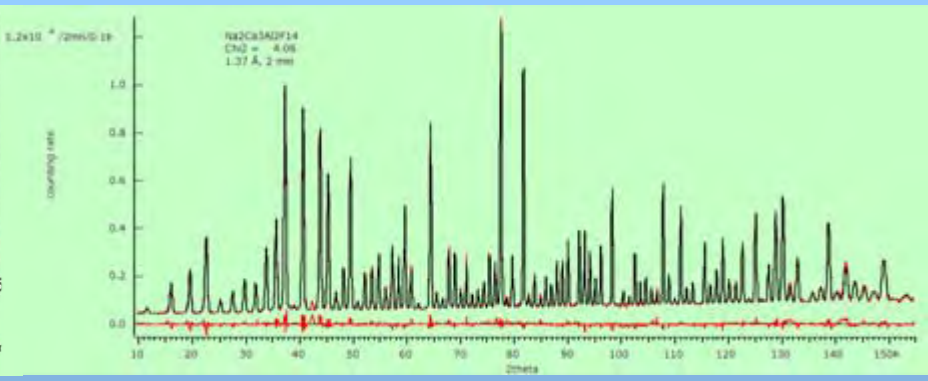
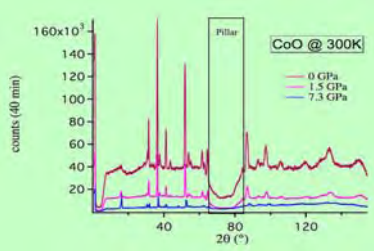


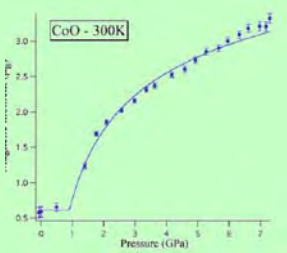
Fig. 7. Rietveld Refinement plot for a 2 mm³ sample of Yttrium Iron Gar net (YAG), after an overnight data collection.

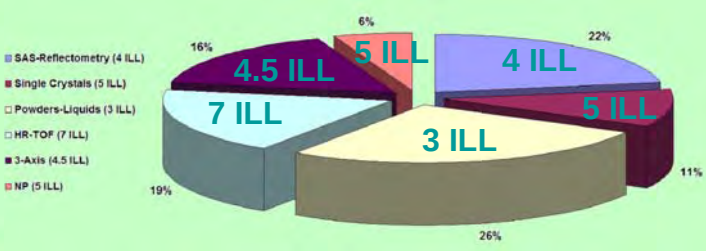


2mm³ YAG on GEM for ~700 min

~700mm³ $Na_2Ca_3Al_2F_{14}$ on D20 for only 2 minutes !!







Magnetism at 7 GPa on D20, Paris-Edinburgh cell

3 ILL machines for ¼ of all proposals

Can ILL compete with the American SNS ?

- Use our natural advantage – time average flux on the sample
- Use big detectors, as on pulsed neutron sources
- Act now – don't wait for the SNS to take away our lead