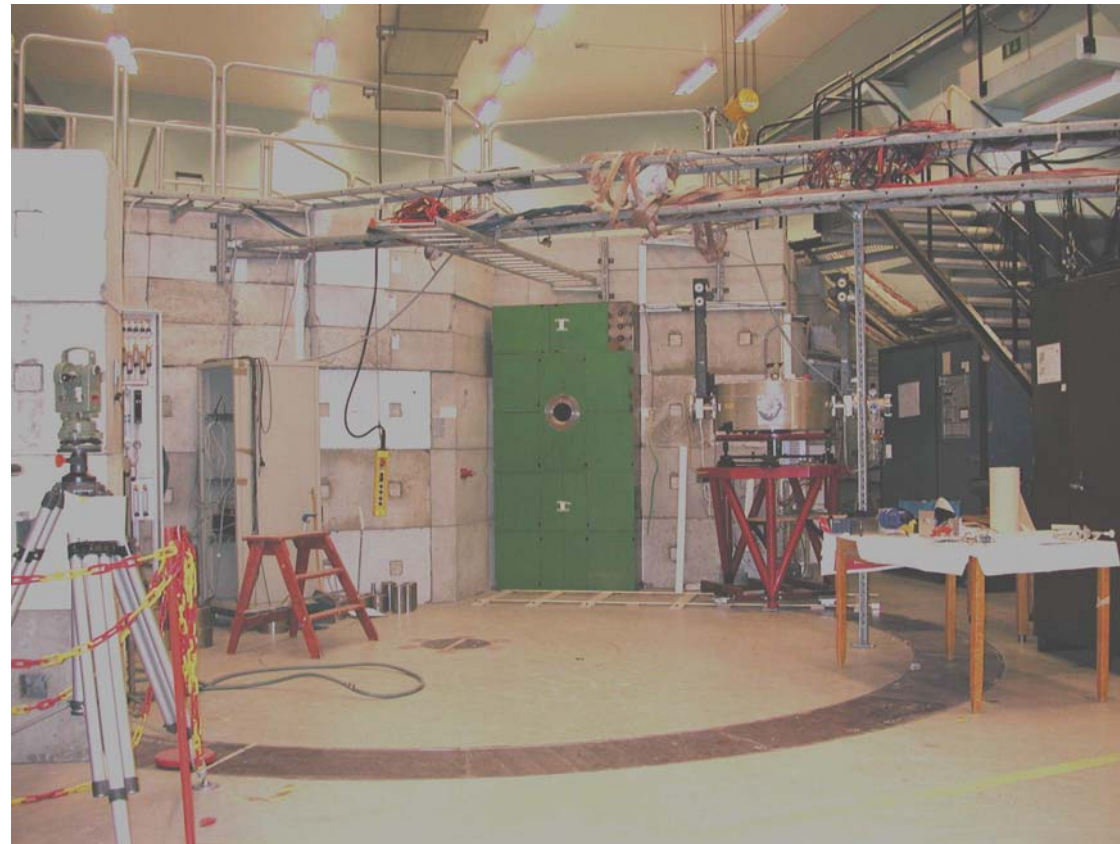




UPPSALA
UNIVERSITET

Status and prospects of TSL neutron facilities



pernilla.andersson@tsl.uu.se




Why am I here?

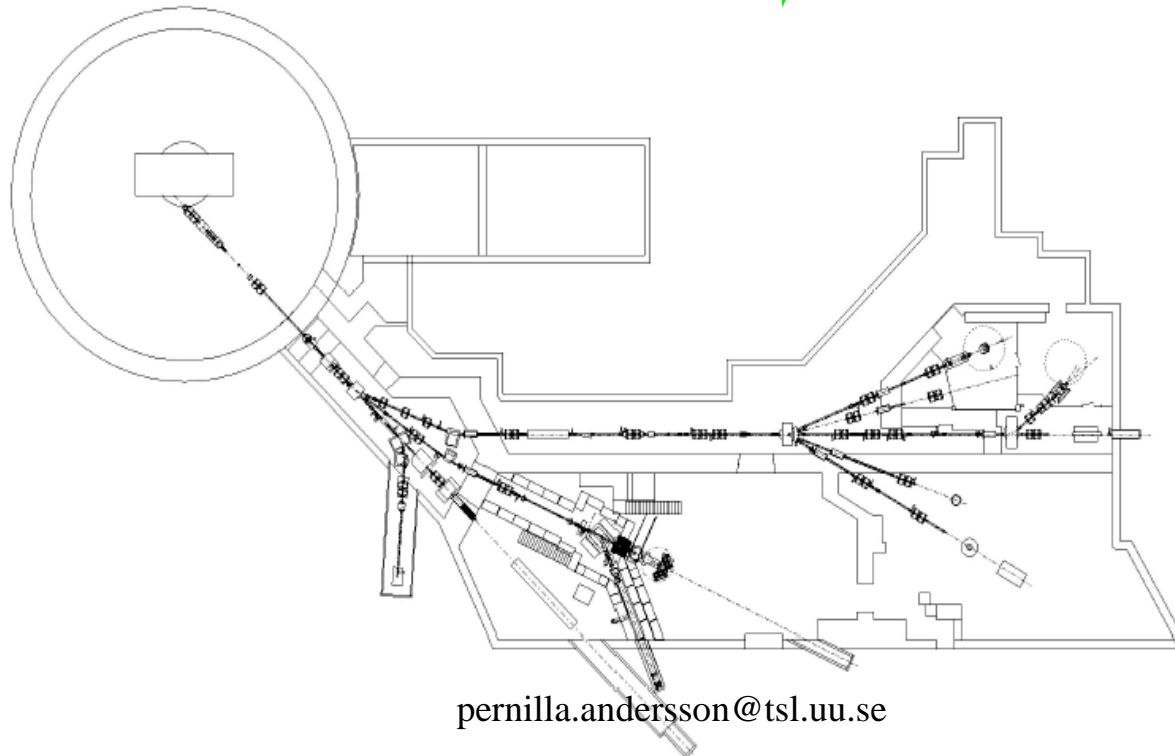
- Bumpen is being checked by IAEA today!
- TSL is ready for the fission based neutron detectors developed at PTB within JRA2
- Other instruments at TSL to support these measurements: Medley and SCANDAL have both been recently upgraded



UPPSALA
UNIVERSITET

TSL – The Svedberg Laboratory

- Broad proton beam
- Quasi monoenergetic neutron beam
- White neutron beam 



pernila.andersson@tsl.uu.se



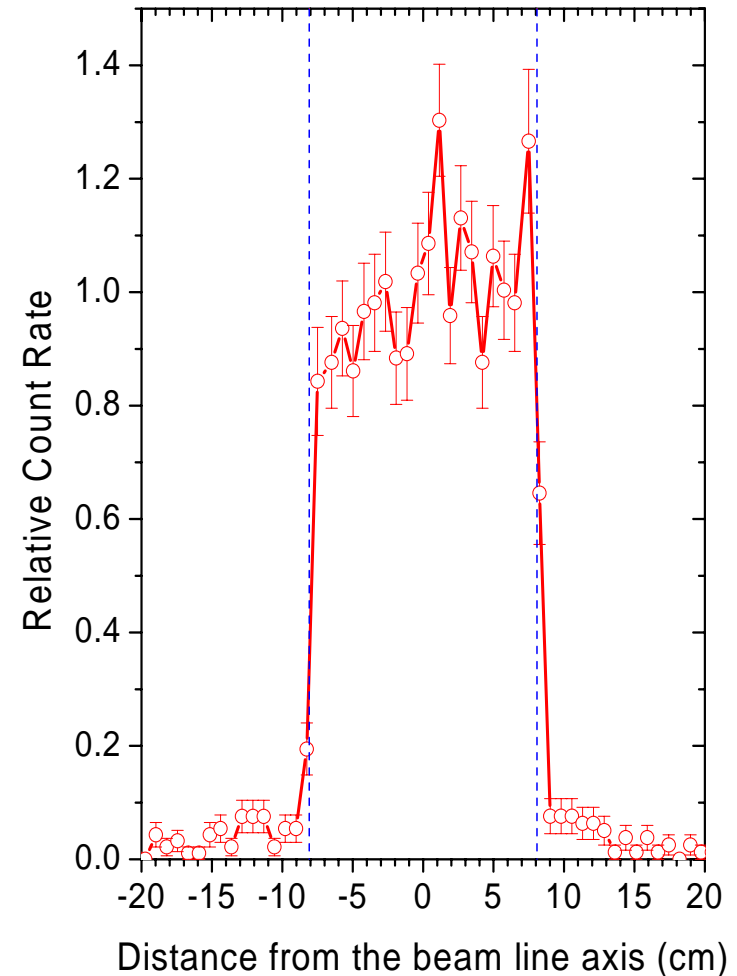
Monoenergetic neutron beam

- Neutron production: ${}^7\text{Li}$ (p,n)
- Peak neutron energy: 11 – 174 MeV
- Characterized neutron fields: 11, 22, 47, 94, 143, 174 MeV
- Peak neutron flux: $1 \cdot 10^4 - 5 \cdot 10^5 \text{ cm}^{-2} \text{ s}^{-1}$
- Beam diameter: 0 – 30 cm close to production target
1 m at larger distances



Monoenergetic neutron beam

- Beam spot uniformity: 0.5%
- Any shape
- Quick manual change of collimators
- The beam can be turned on and off at any time by the user





UPPSALA
UNIVERSITET

Mono energetic neutron beam

Neutron spectra at 0°

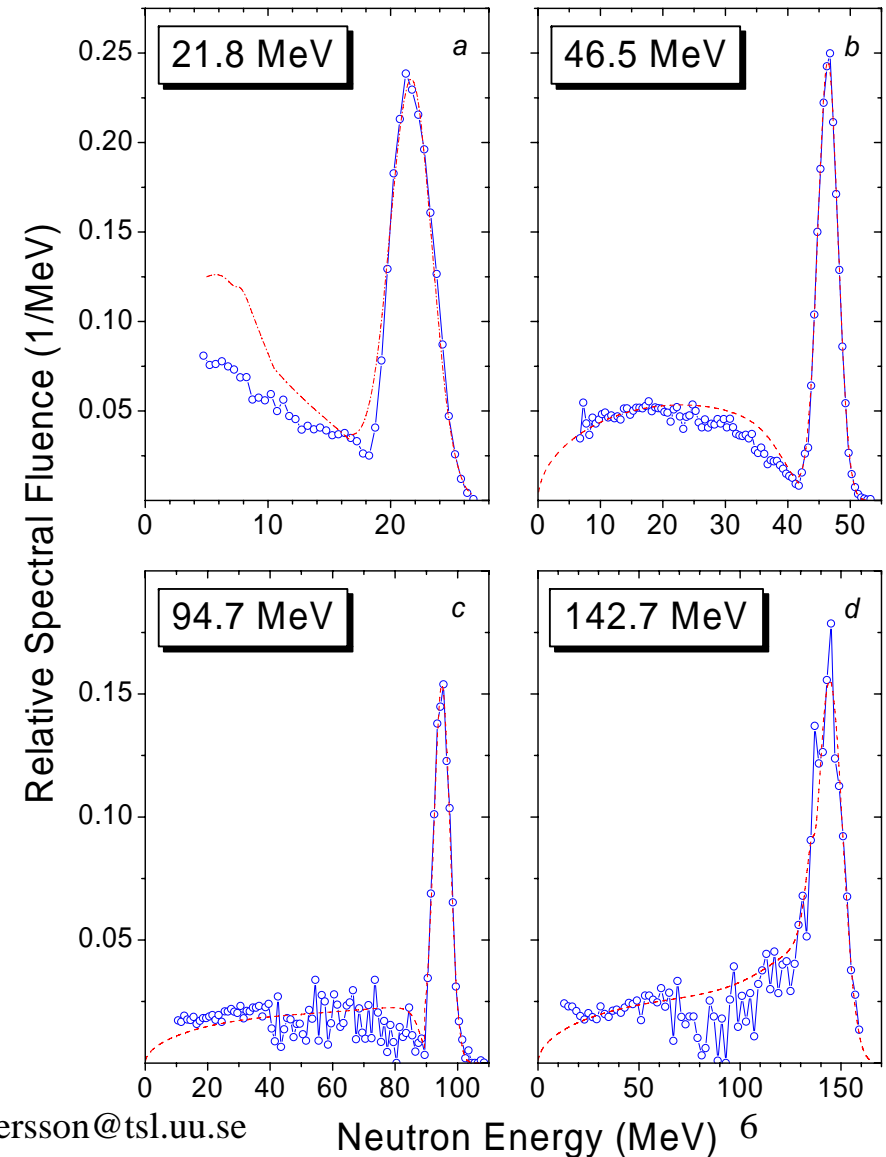
Blue symbols:

Experimental data

Dashed red lines:

Model calculations:

40 % of all neutrons
in the peak



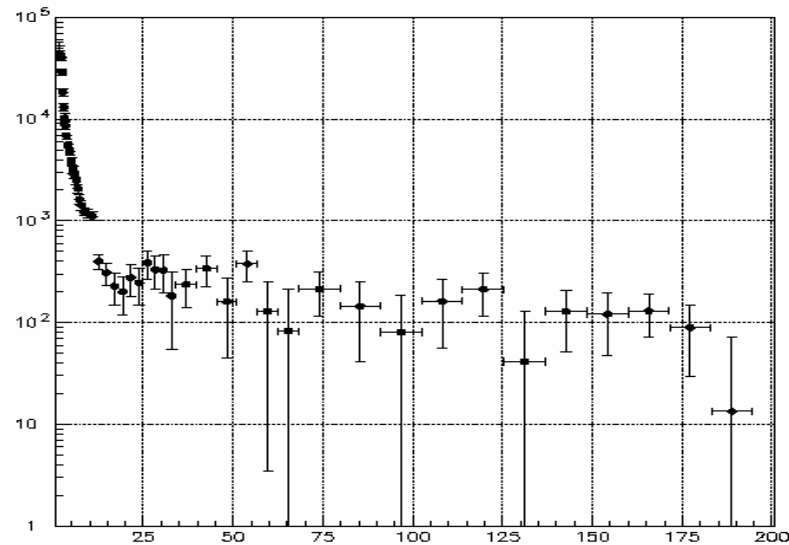


White neutron beam – ANITA

Atmospheric-like Neutrons from thick Target



- 180 MeV proton beam on a full-stop tungsten target
- First run in March 2007 – results are available
- Neutron flux: $\sim 10^6 \text{ cm}^{-2} \text{ s}^{-1}$ at collimator exit
- No charged particles observed



ANITA neutron spectrum

pernilla.andersson@tsl.uu.se



UPPSALA
UNIVERSITET

SCANDAL

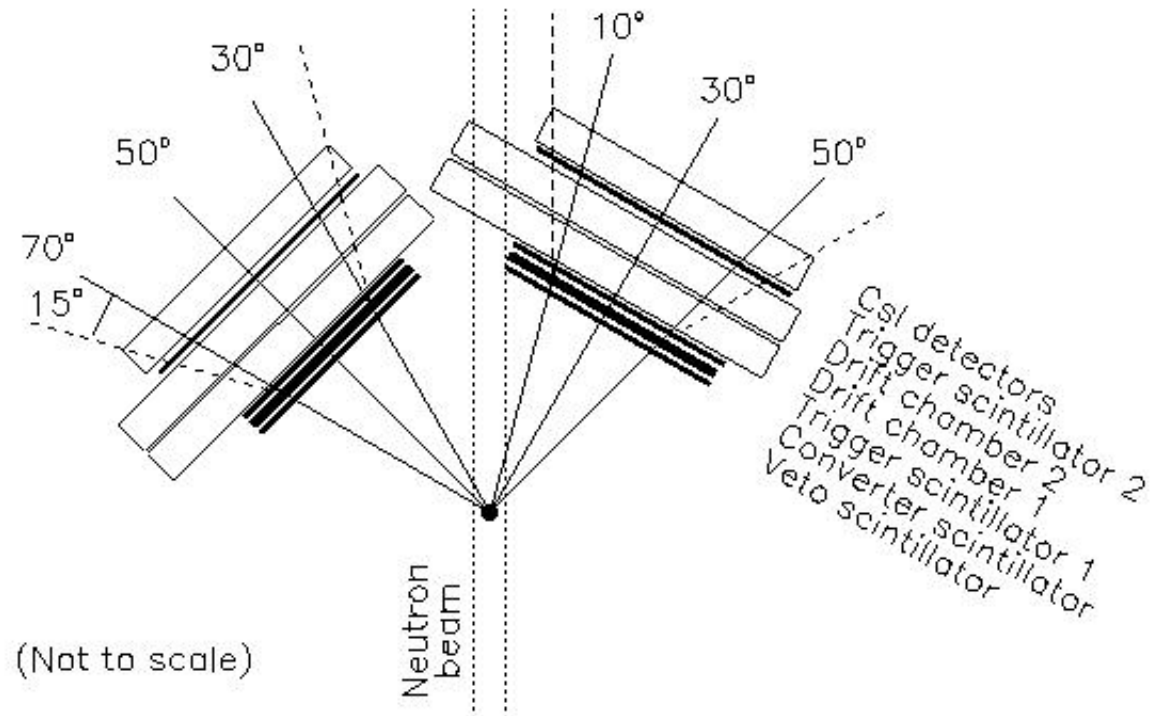
SCattered Neutron Detection AssembLy

- Two identical arms
- Neutron detection by conversion into protons
- Large solid angle
- All angles measured simultaneously



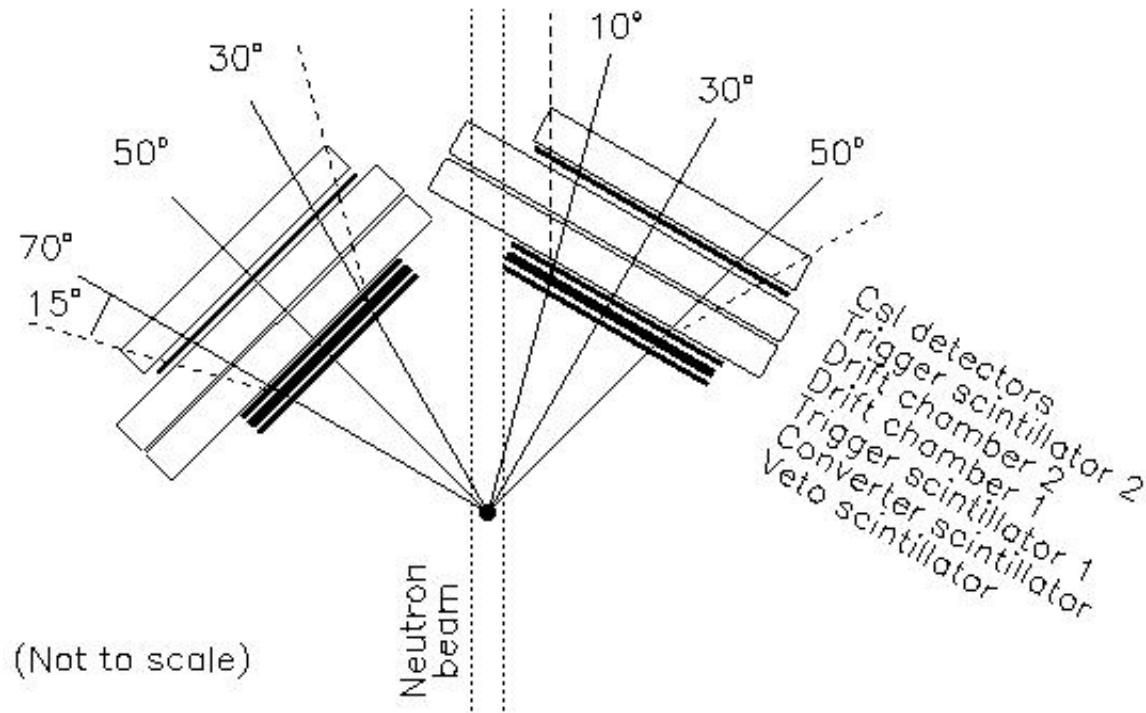


SCANDAL





SCANDAL



- SCANDAL is being upgraded with new thicker Csl scintillators for measurements at higher energies: 180 MeV



The future at TSL

- 180 MeV protons only?
 - ⇒ White neutron beam
 - ⇒ One single energy for the monoenergetic neutron beam
 - ⇒ Anyone who wants to use the TSL facility at any other energy must hurry up!





UPPSALA
UNIVERSITET

EFNUDAT meeting in Uppsala this fall

Welcome!