Model versus reality

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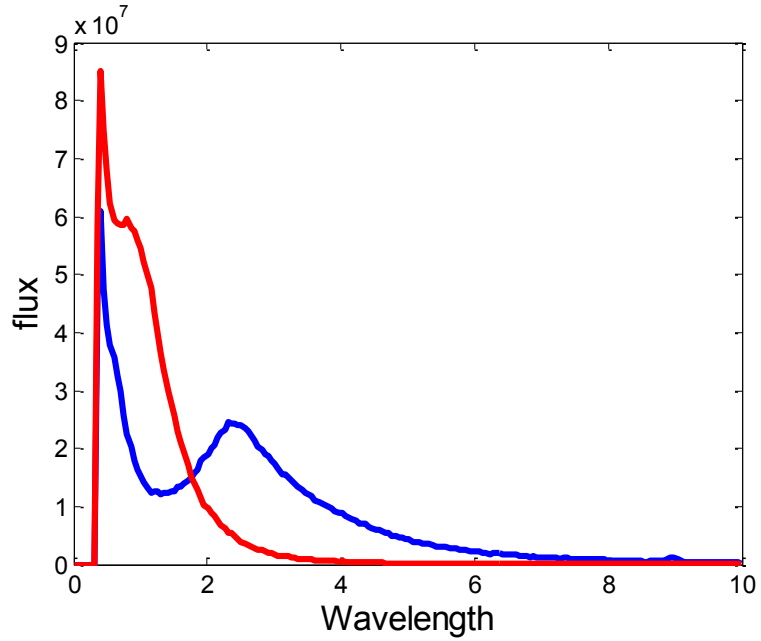
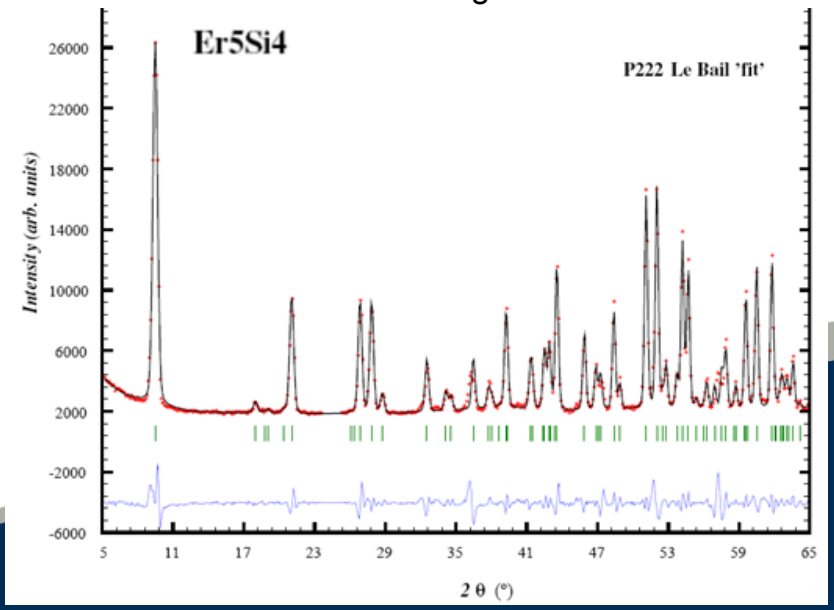
ISIS

The moderator flux and time structure is KEY to instrument performance

- Flux profile determines instrument dynamic range



- Time structure determines instrument resolution $\Delta d/d$ or $\Delta E/E$



TS1 upgrade – it had better not ruin my resolution!

- Instrument scientists worried upgrade could change time structure and can one believe the neutronic simulations.
- They are right to worry - (Almost) NO confirmation that neutronic moderator simulations agree with experiment.
- TS1 is 30 years old and original moderator calculations done on back of envelope
- To give everybody confidence we need confirmation that TS1 neutronic simulations agree with experiment
- Matt Fletcher and team have figured out the engineering details of TS1 and Stuart Ansell and team have used this to make new neutronic calculations
- Next step is to compare with what we measure on the instruments!

Model versus reality

Not so easy!! Flux profile and time structure change because of instrument guides, choppers, detector efficiencies and sizes etc.

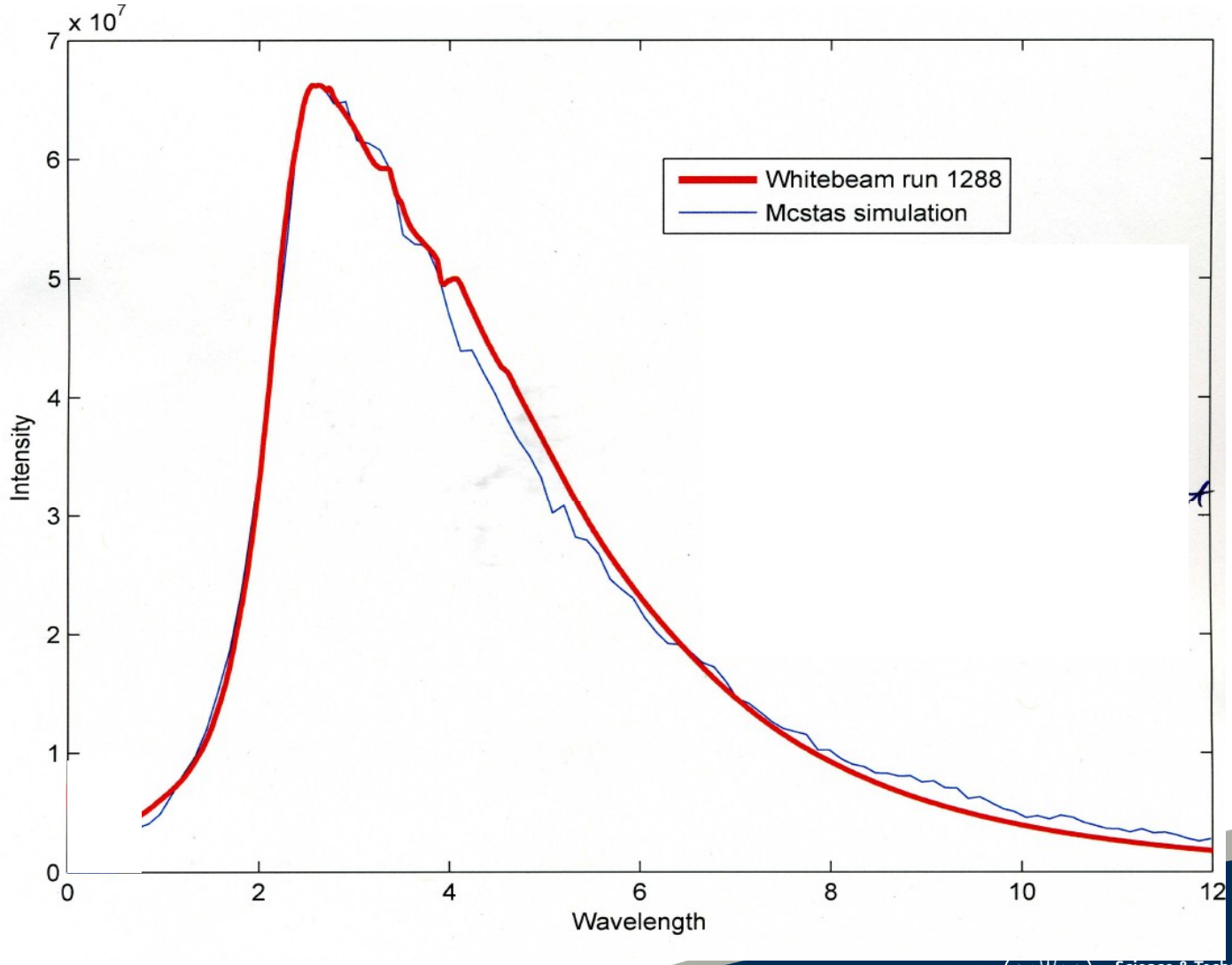
Therefore have to also model the instrument

McStas - A neutron ray-trace simulation package

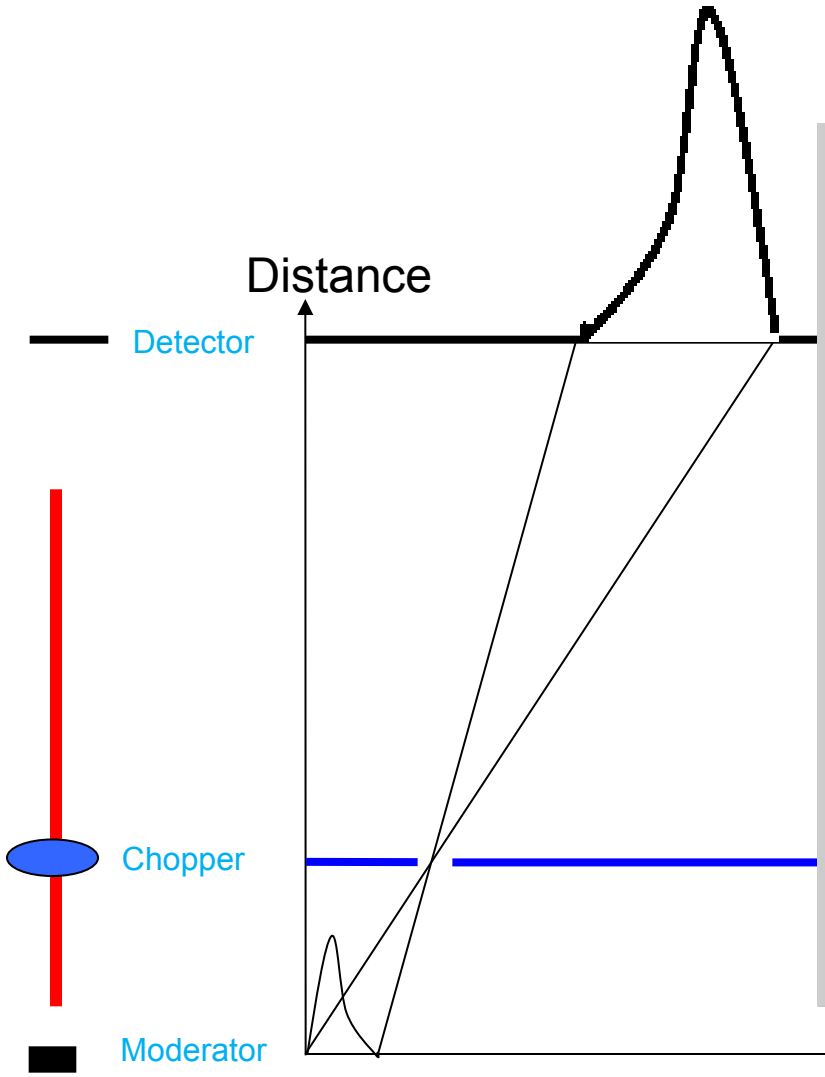
LET – Chopper spectrometer

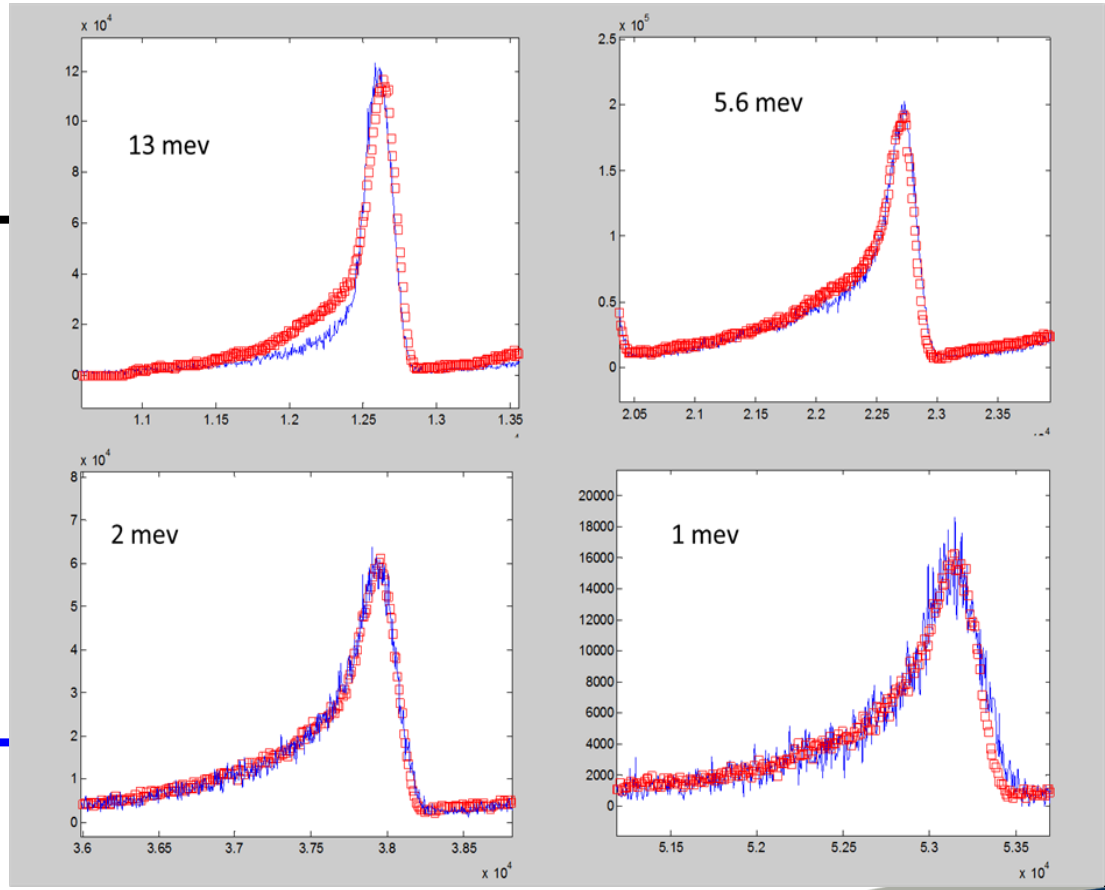
Views coupled H moderator on TS2

Model versus reality - Neutron flux



Model versus reality - Time structure





SUMMARY

- Model agrees with reality (for this one instrument and moderator)

- Gives the engineers and modellers confidence in their work

- Gives the scientists confidence in the models and will worry (slightly) less that an upgrade will ruin their instruments