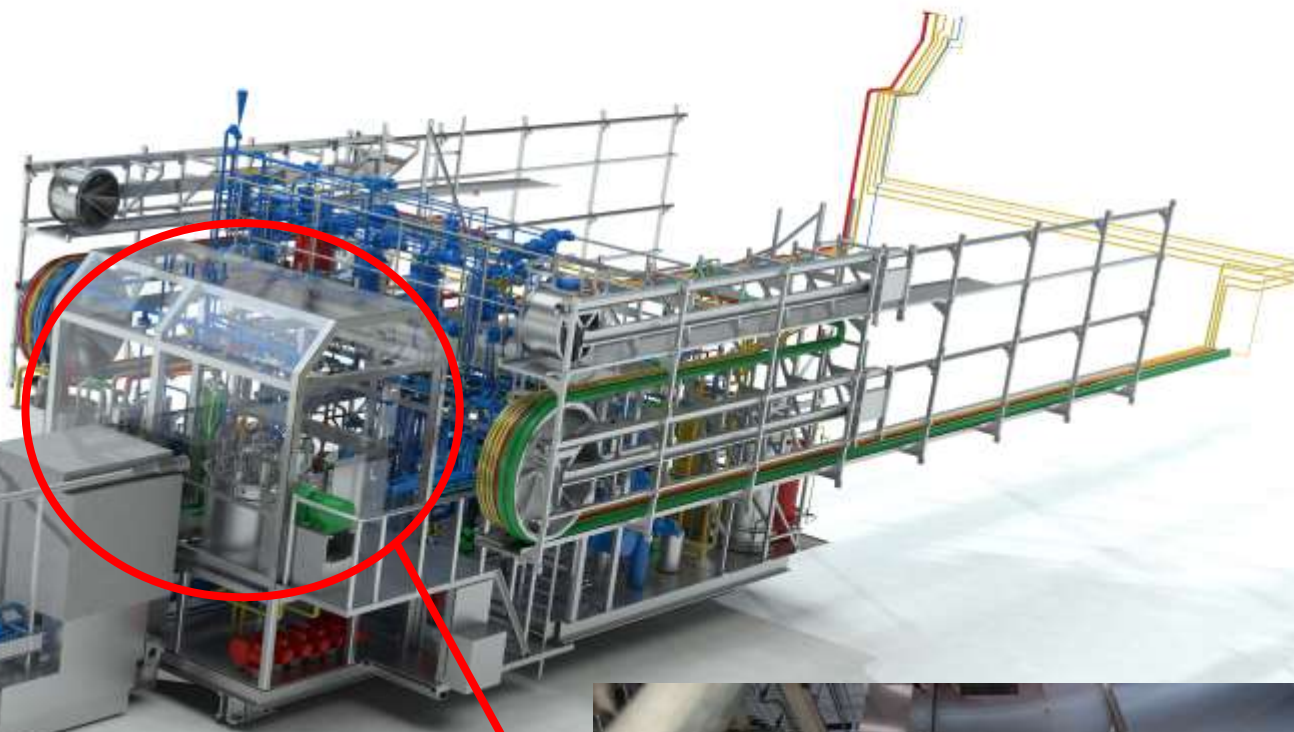


# ISIS Moderator update

S Lilley on behalf of ISIS neutronics group

# TS-1 Systems

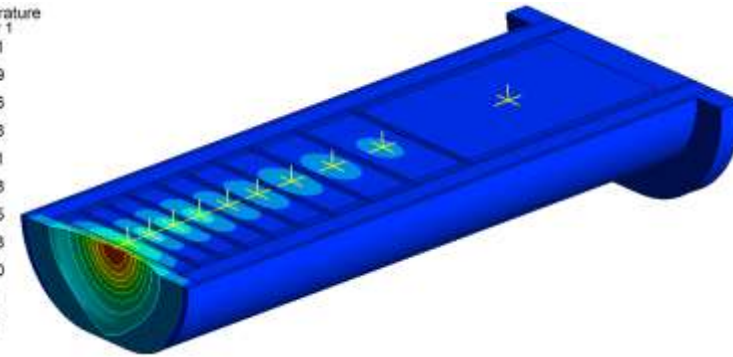
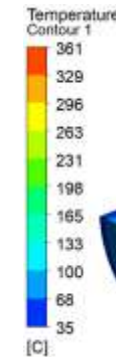


# Target station 1

- Targets station 1 at ISIS has been undergoing a major refurbishment
  - New Target reflector, and moderator assembly
  - Significant changes to cryo moderators
  - Addition of pre-mods
  - new target and moderator services – new cold boxes etc.
- 1<sup>st</sup> beam November 22 – just a trickle
- MS/4 beam in December – but some issues
- MS beam early 23 – lots of issues with moderator cryo-systems, several parts need replacing,

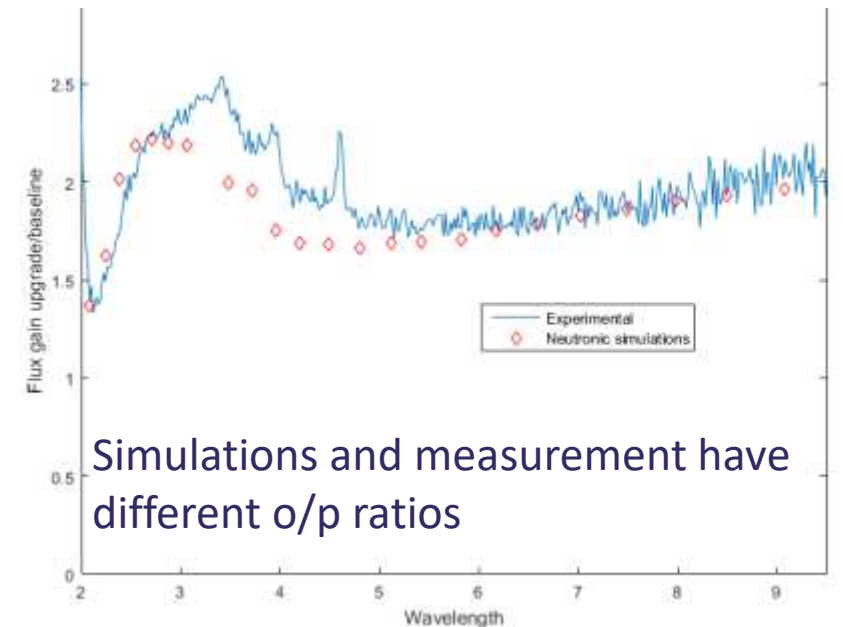
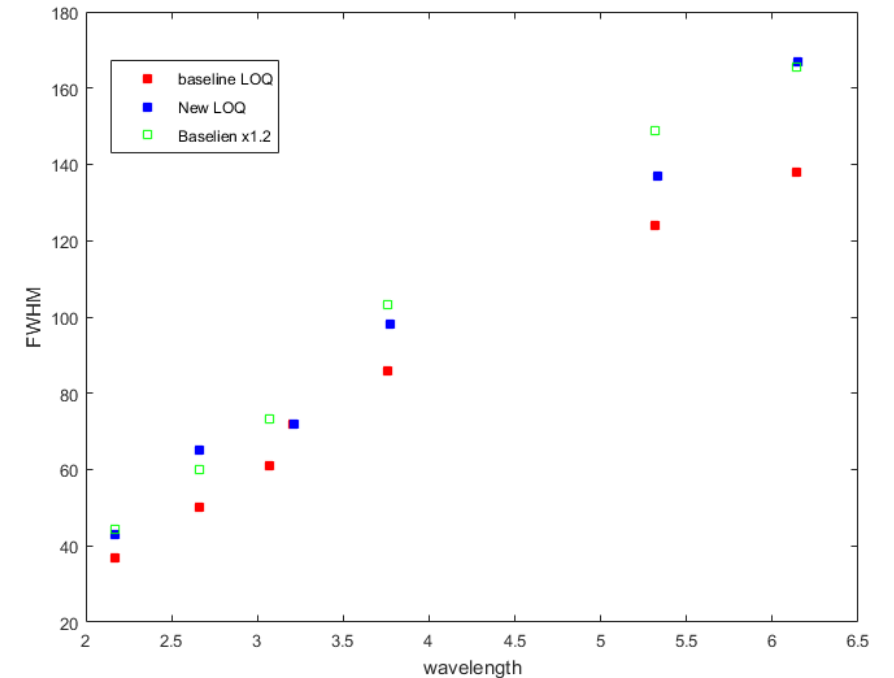


Cold box insides



# Target station 1

- Hydrogen – coupled moderator
- Target was 20 % broader resolution
- Aiming for around factor of two
  - From pre-mod
  - From improved ortho-para ratio
- Sample taken at end of December run
  - Estimated ortho para – 94% +/- 3%
  - Previous system estimate was around 85%, but vari



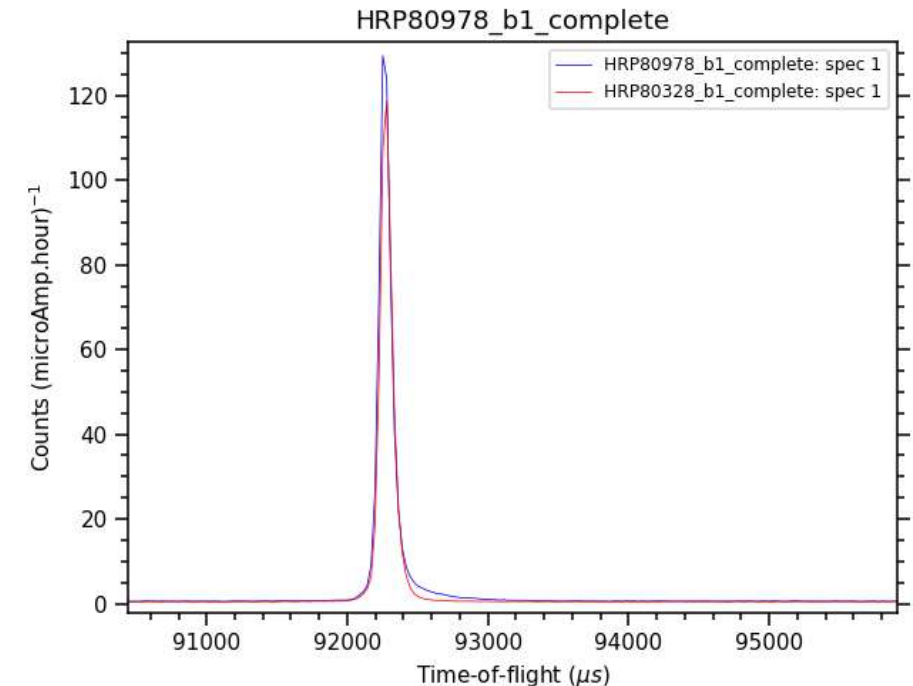
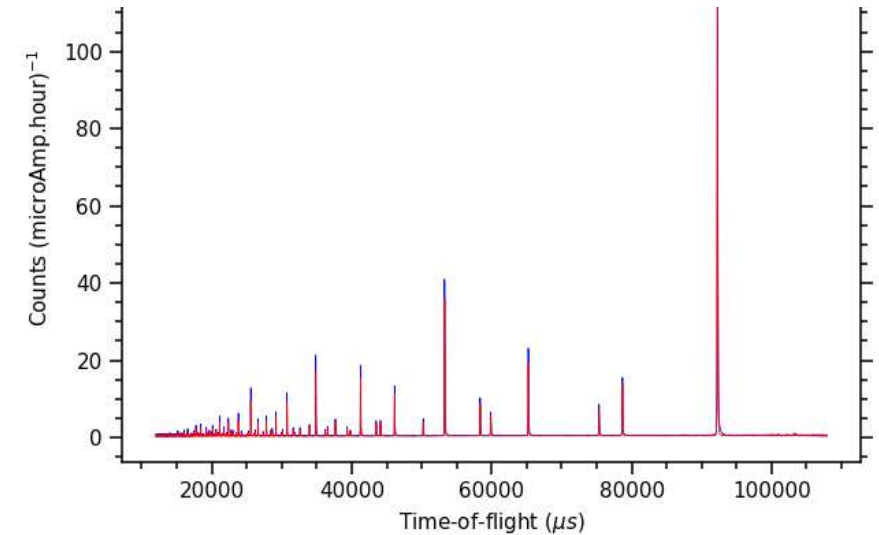
# Target station 1

## Decoupled Liquid Methane

- Requirements was no change in resolution
- Dual poison foil moderator
- Pre-mod added
- Measurements showed flux gain around 15% as expected
- Measurements showed FWHM matched previous
- Measurements showed slight tail – at the few % difference level
  - Causing problems for the diffraction instruments fitting the structure factor
  - Currently investigation options to remove the tail

Blue (with the new moderator)

Red (with the old moderator)



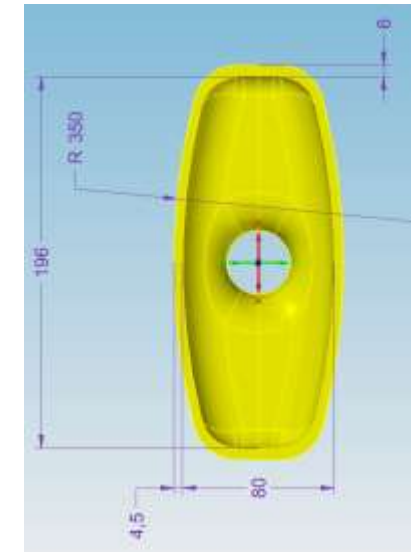


# Target station 2

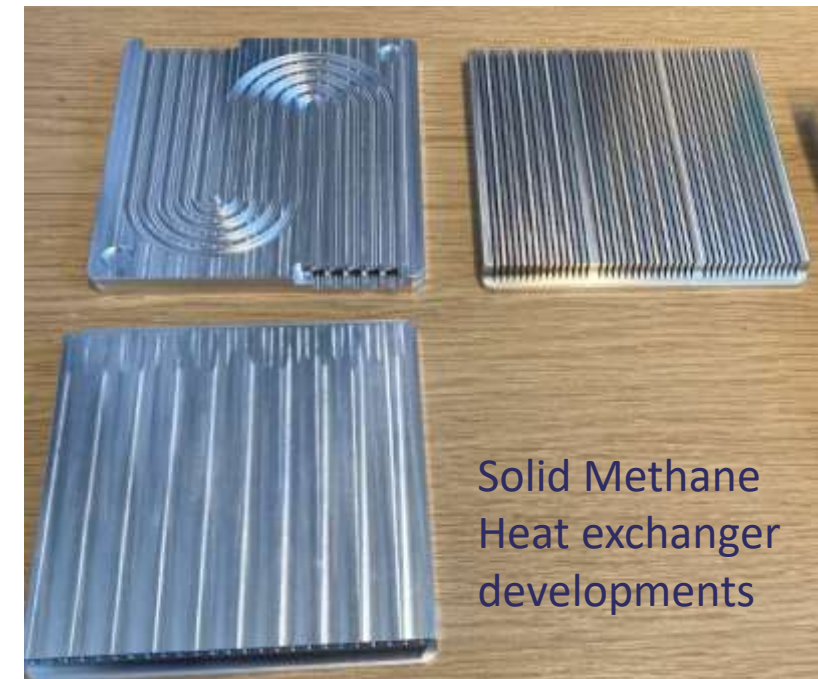
- Hydrogen moderator, new optimised design, currently out for manufacture, installation planned for the summer
- Solid methane moderator improvements under development
  - Improved heat exchanger
  - Addition of poison foil



old



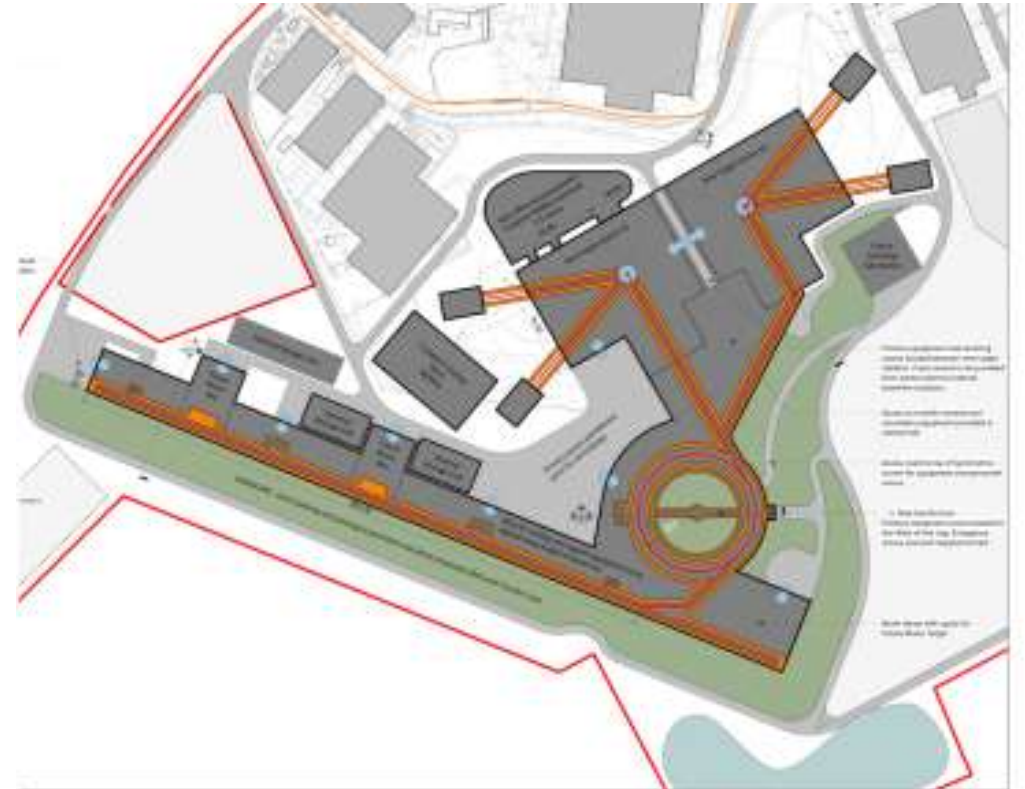
new



Solid Methane  
Heat exchanger  
developments

# ISIS-II

- Early planning for future short pulse spallation
- 2 main options :-
  - New build - GeV proton beam, 2 target stations
  - Upgrade ISIS
- Possibility of moderator engineering test facility using FETS facility



# Summary

- Updated TS1 moderators have seen first beam,
- Initial indications are that they are mostly following the predictions.
- Slight tail in the methane causing some issues
- TS2 hydrogen upgrade planned for the summer