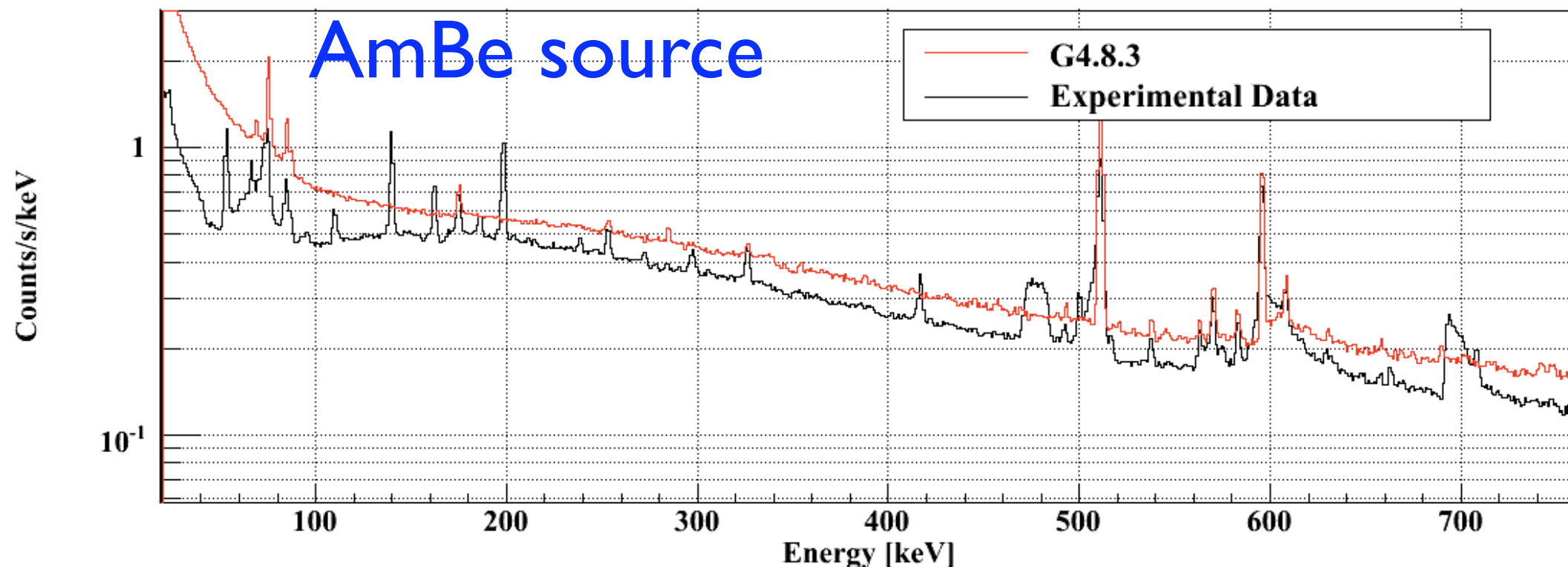
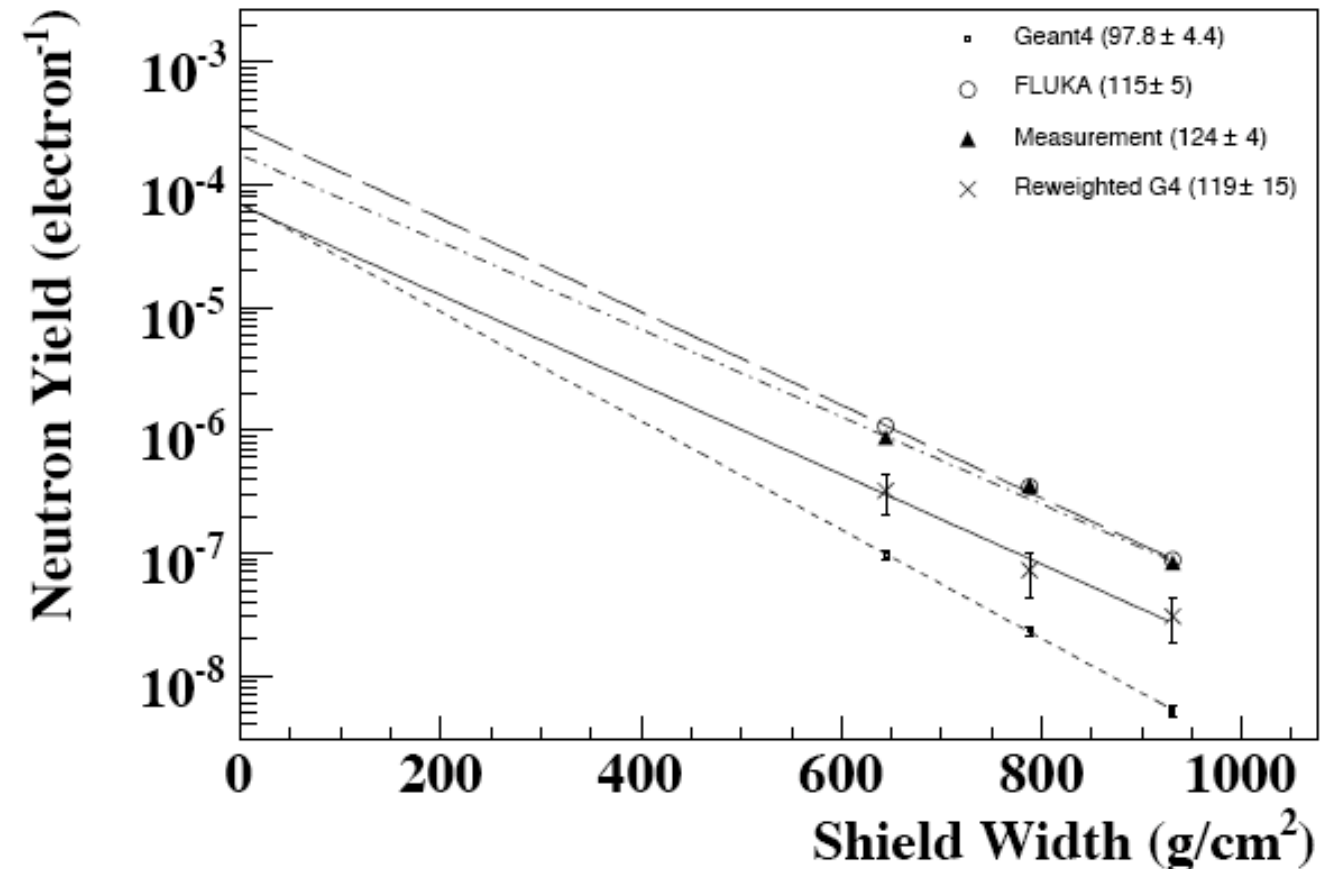


Neutron Physics in G4

Jason Detwiler
MaGe Workshop 2010
18-20 January, Munich

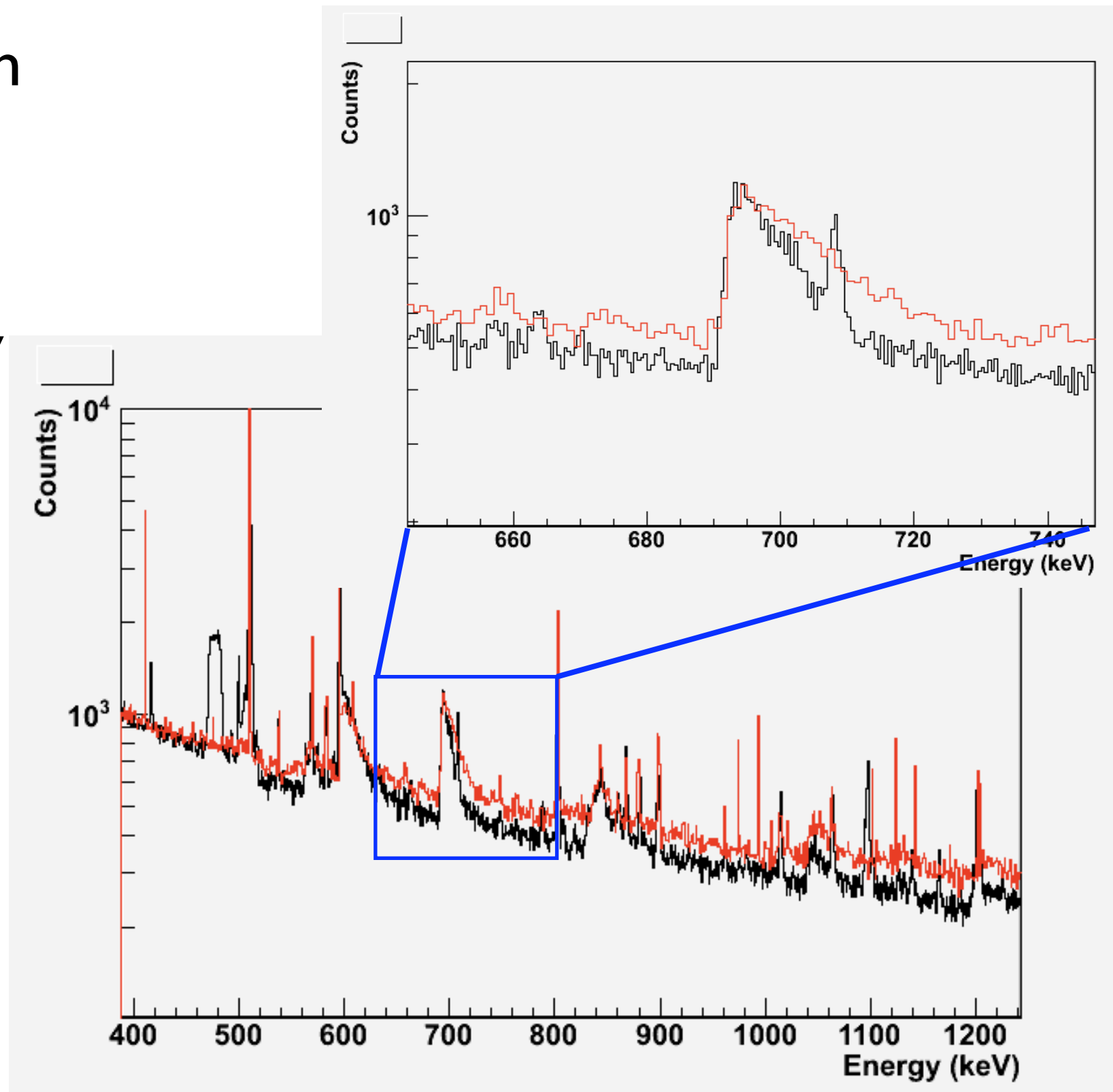
G4 Neutron Validation

- Past work identified problems in
 - n production
 - n attenuation
 - missing / extra lines at low energy



G4 Neutron Validation

- Bug fixes in conversion electron emission
- Added γ/e^- -transition data files calculated by TALYS
- Peak now appears for E0 692 keV transition in ^{72}Ge
- Still investigating missing lines, quenching problems, spurious low-E γ 's



Reported Bugs

- See the list of bugs I have compiled at

<http://mjwiki.npl.washington.edu/bin/view/MaGe/Geant4NeutronSimulationIssues>

New G4 Neutron Package

- A replacement for NeutronHP has been in development at Stanford and LLNL for several years now
- All but the inelastic interactions were implemented by Nov. 2008
- In November (2009), I was invited to help the effort (at least as a consultant)
- Last week I received access to the computers, but still have not seen the code

Suggestions for the New Package

- Emit warnings whenever an appropriate data file can't be found
- Do not load data for another nucleus by default
- Use the data-driven model over the entire energy range available in the data files (by default)
- Make it easy to add / override a specific channel
- Allow users to turn off/on channels in different regions / materials
- Only load data files as needed (like Auger data)
- Please send me any suggestions you may have, I will try to see that the new package addresses them

CHEERS!

