Second Advanced Workshop on Model Codes for Spallation Reactions

Some conclusions of the workshop

Objectives of the workshop

Provide the conclusions of the benchmark

➥ **final report**

➢ **Discuss the global analyses of residues, neutrons, light charged particles**

➢ **Correct errors / provide missing information**

➢ **Provide conclusions on each calculation (strong / weak points) ➔ 2 pages per calculations**

➢ **Draw physics conclusions, consensus on some parameters / ingredients**

➢ **Identify still missing experimental data**

➢ **Impact for applications**

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Discussion on conclusions

➢ **Possible conclusions on physics of the models**

➢ **Impact for applications**

➢ **Still missing experimental data**

➢ **Possible continuation of the benchmark**

Possible conclusions on physics

- ➤ **INC models work more or less at low energies (but cannot reproduce interference, collective, detailed structure effects)**

- ➤ **Coalescence process necessary to reproduce high-energy tail of LCP spectra but does coalescence imply depletion in n, p spectra?**

- ➤ **Is pre-equilibrium necessary?**

- ➤ **Hauser-Feshback not necessary, taking into account of angular momentum carried by evaporated particles may be important for fission**
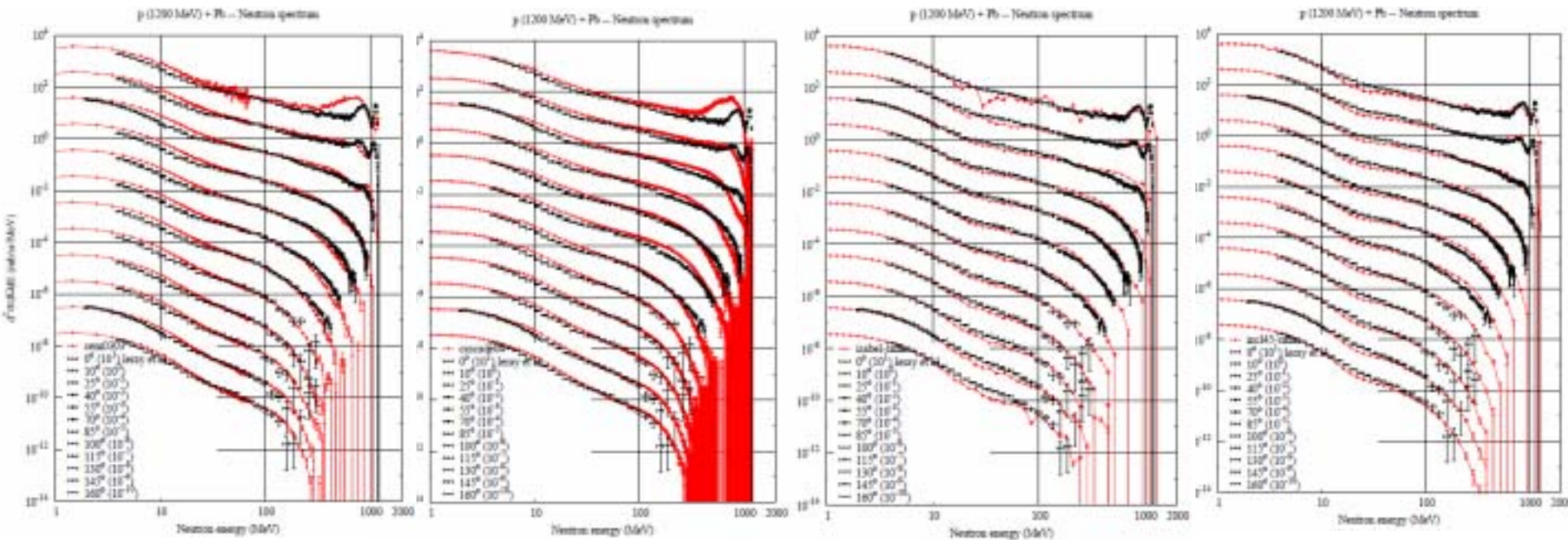
- ➤ **Are QMD models promising?**

Possible conclusions on physics

➢ **Coalescence process necessary to reproduce high-energy tail of LCP spectra**
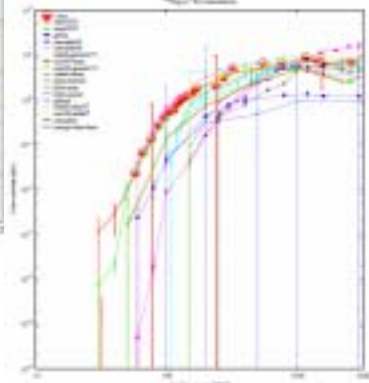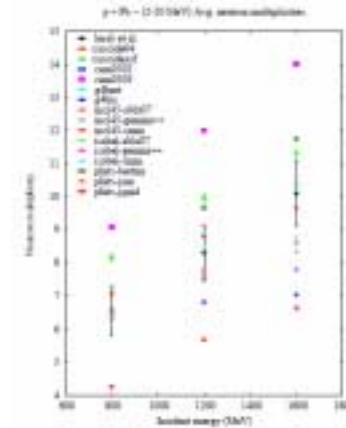
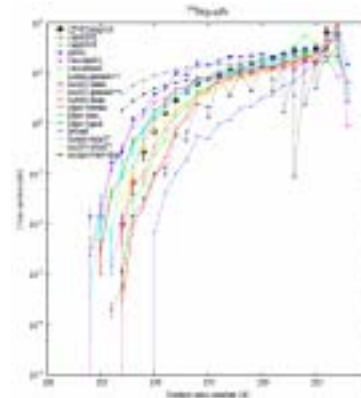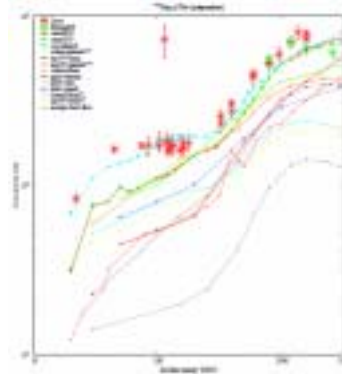➢ **Does coalescence implies depletion in n, p spectra?**
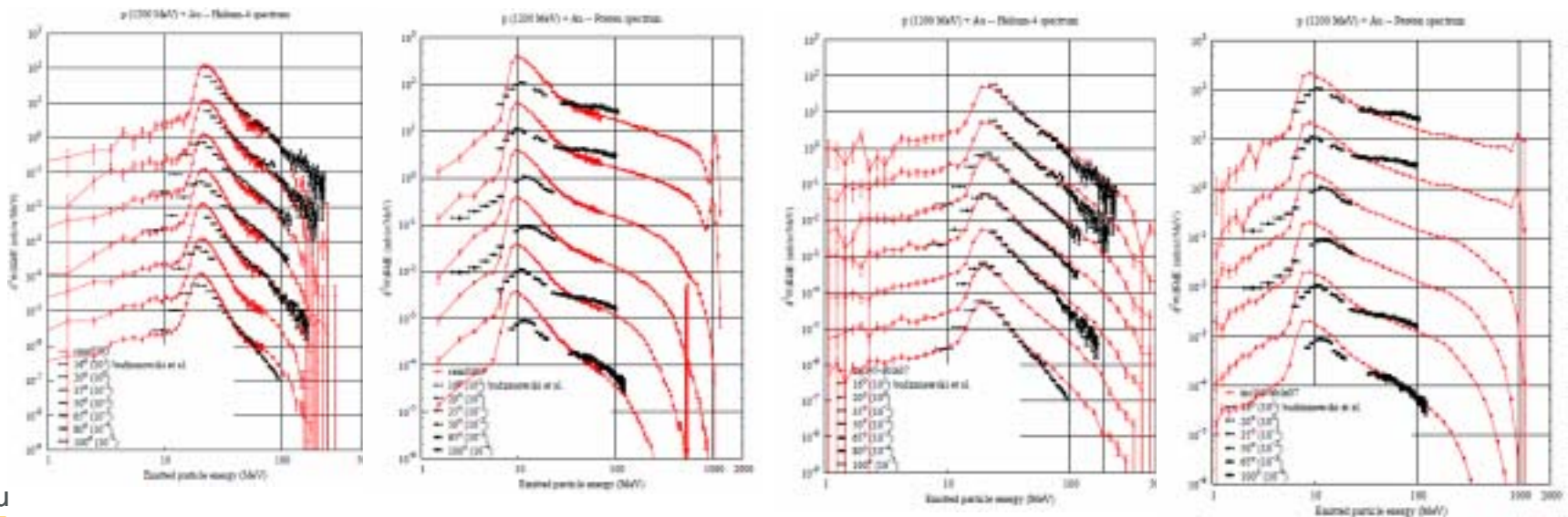
Possible conclusions on physics

➢ **Is pre-equilibrium necessary?**

Impact for appications

➢ **Average n multiplicity for spallation sources**

➢ **Neutron high energy tail for shielding**

➢ **Helium production**

➢ **(Tritium production)**

➢ **Residues close to projectile**

➢ **Volatile fission elements on Pb**

Still missing data

➢ **Existing data that should be calculated**

  o **to check behaviour for different nuclei (ex: light targets), intermediate energies (ANDES)**

➢ **New data needed**

  o **For blind calculations**

  o **Correlation data**

  o **Pion data?**

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Possible continuation ?

> **A "dynamical" continuous benchmark so that end-users of spallation models in transport codes have up-to-date information**

➥ **new versions of the models / new models compared to the benchmark set of data added on the website**

➥ **new experimental data : ask authors to do additional calculations or do calculations with the version of the code given by the authors**

➥ **distributions of the code by IAEA (or NEA?)**

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Discussion on conclusions

Final report:

- ➢ **Global analyses**
  - ○ **Neutrons factor 2**
  - ○ **Residues**
  - ○ **LCPs**
- ➢ **2 pages / calculations**
- ➢ **Physics conclusions**
- ➢ **Recommendations for end-users**
  - ○ **Examples of important observables**
- ➢ **Proposal for a possible continuation**

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