

Hadronic Group Work Plan 2011

Main Areas of Focus

- Model development
- Validation
- Cross sections

Model Development (1)

- String models (Vladimir Uzhinsky)
 - implementation of anti-baryon-nucleus and anti-ion-nucleus interactions in FTF (June 2011)
 - tuning and validation of annihilation in FTF (September 2011)
 - addition of Reggeon cascade to QGS (2012)
 - improved small-mass string fragmentation in QGS (2012)

Model Development (2)

- Bertini cascade (Mike Kelsey, Dennis Wright)
 - Implementation of Propagate() method for use with FTF (June 2011)
 - addition of coalescence model in cascade stage of Bertini (September 2011)
 - possibly also in precompound stage
 - implement trailing effect (June 2011)
 - develop a better model for nuclear recoil (December 2011)
 - addition of anti-baryon-nucleus and anti-ion-nucleus interactions (2012)

Model Development (3)

- INCL/ABLA (Pekka Kaitaniemi)
 - add new model (INCL++) (September 2011)
 - Develop de-excitation handler interfaces for INCL models (December 2011)
- Radioactive decay (D. Wright, M. Maire, L. Pandola, L. DeSorgher, V. Ivantchenko)
 - update Geant4 version of ENDSF to 2011 (September 2011)
 - add validation tests (December 2011)
 - improve photo-evaporation code (2012)
 - improved handling of meta-stable states (2012)

Model Development (4)

- Neutrons
 - complete interface to ENDL database (T. Koi, B. Beck) (May 2011)
 - install alternate G4NDL implementation (T. Koi, D. Cano-Ott, J.-M. Quesada) (May 2011)
- Ions (T. Koi)
 - extend energy reach of G4QMD (December 2011)

Model Development (5)

- De-excitation (V. Ivantchenko)
 - finish clean-up of multi-fragmentation and GEM codes (June 2011)
- Coalescence model for precompound/evaporation stages (V. Ivantchenko) (December 2011)
- Study CHIPS for code speed-up (Fred Jones)
- CHIPS re-organization (D. Wright, G. Folger)
- Refactoring based on architecture review (depending on review time-scale)
 - all model maintainers

Validation (1)

- Continue to populate new validation and test facility
 - H. Wenzel, J. Yarba, D. Elvira (December 2011)
- Complete validation suites in all energy ranges
 - high energy
 - G. Folger (December 2011)
 - stopping particles
 - F. Jones, J. Yarba (December 2011)
 - ion-ion
 - T. Koi (December 2011)

Validation (2)

- Shower shapes (A. Dotti, J. Apostolakis)
 - compare to HELIOS, (NA62) data (May 2011)
 - develop more detailed tests of shower shape composition, with new observables (April 2011)
- Transition region (A. Dotti, J. Apostolakis)
 - study effect on energy resolution (June 2011)
- G4Precompound/evaporation (A. Ivantchenko, V. Ivantchenko, J.M. Quesada, M. Kelsey, J. Yarba, A. Howard)
 - detailed comparison of Bertini cascade with and without G4Precompound (June 2011)
 - continued validation and performance improvement

Validation (3)

- Continuing, regular validation effort
 - IAEA, test30, test35
 - [V. Ivantchenko, A. Ivantchenko](#)
- Energy/momentum conservation in models and physics lists (J. Apostolakis, D. Wright, G. Folger) ([April 2011](#))
- Complete SAID cross section work and web pages (F. Jones) ([June 2011](#))
- Cross section validation tests (A. Ivantchenko) ([June 2011](#))

Validation (4)

- Comparison of ion-ion models against Catania 62AMeV data from carbon atoms on various targets (P. Cirrone, F. Romano) (December 2011)

Cross Sections

- Completion of hadronic cross section re-design (G. Folger, V. Ivantchenko, D. Wright) (December 2011)
- Completion of cross section, model and process documentation for physics lists (all) (June 2011)
- LHCb request for accurate cross sections and multiplicities
 - Kaons (June 2011)
 - p/pbar, Λ/Λ bar (May 2011)