

Heavy-ion collisions described by a new QMD code interfaced to FLUKA: model validation by comparisons with experimental data concerning neutron and charged fragment production.

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A new code, based on the Quantum Molecular Dynamics theoretical approach, with many refinements, has been developed by us in the last few years and interfaced to the FLUKA evaporation/fission/Fermi break-up model [1]. At present, this code is undergoing a rich program of validation tests. Here results of the simulations of ion-ion collisions are shown, against experimental data concerning charged fragment yields and double differential neutron production cross-sections in thin targets, at non-relativistic bombarding energies. Further comparisons with the results of simulations performed with another model, already available in the FLUKA code [2], based on a modified version of RQMD 2.4 [3], are presented. The current performances of both models are pointed out and potential improvements are briefly sketched.

[1] M.V. Garzelli, F. Ballarini, G. Battistoni *et al.* “*Heavy-ion collisions: preliminary results of a new QMD model coupled with FLUKA*”, poster presented at NPDC 19, Pavia, Italy, September 5 – 9 2005; submitted to the IOP Journal of Physics, Conference Series.

[2] See <http://www.fluka.org> and references therein.

[3] F. Ballarini, G. Battistoni, F. Cerutti *et al.*, “*Nuclear Models in FLUKA: a review*”, Proceedings of the 10-th International Conference on Nuclear Reaction Mechanisms, June 9 – 13 2003, Varenna, E. Gadioli ed., Ricerca Scientifica ed Educazione Permanente Suppl. **122**, 579, Univ. Milano, 2003.