Study of heavy ion collisions dynamics around Fermi energies.
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The aim of this work is to improve our understanding about heavy ion dynamics in collisions at incident energies around the Fermi energy. The comprehension of the behavior of nuclear systems in this energy domain constitutes a fondamental key in order to establish links between experimental results and the nuclear equation of state by means of theoretical models. To this end two codes, making use of different formalisms, will be exploited. One of them is the DYWAN model, which is based on the ETDHF (Extended Time Dependent Hartree-Fock) approach, and the other one is the BLOB model, based on the BUU (Boltzmann-Uehling-Uhlenbeck) and the BL (Boltzmann-Langevin) approaches. The specificity of those models will allow us to test different aspects of the nuclear dynamics and the corresponding results will be compared with the experimental data gathered by the INDRA collaboration.
The existence of a large mass-energy experimental systematics identifying the properties of multi fragmentation process will make possible to work on different aspects like the stopping power, the expansion energy and on the dynamics of the phase transitions which could be at the origin of fragment formation in this energy domain.

The candidate will utilize the existent numerical codes in order to perform systematical calculations to be compared with the experimental data. He or she should try to put in evidence the possible links between the ingredients of the models (effective force parameters, nucleon-nucleon cross-section) and the behavior of the measured observables.

A measurement campaign with the coupling of INDRA & FAZIA detectors at GANIL, located in Caen, being planned in the coming years, the student will be invited to take part in discussions within the community. In this context, he or she may be brought to participate in the experiments and the associated analysis.

It is strongly requested to the candidate to posses good knowledge of theoretical and experimental nuclear physics, of computational and numerical tools as well a good affinity with program development. Autonomy, strictness, imagination and initiative are necessary qualities for the good proceeding of the thesis. The direction of this work will be insured in first place by Eric Bonnet (CNRS) and, in second place by Virginia de la Mota (Université de Nantes), both members of SUBATECH Laboratory.

The financial support of the thesis is covered by both the IN2P3 (CNRS institute) and the administration of the Pays de la Loire Region, for 3 years starting on the 1st October 2018.

The applications must be sent to Eric Bonnet at **eric.bonnet@subatech.in2p3.fr** before **4th of May 2018**. They must include a detailed CV, a motivation letter and all other written information which may contribute to evaluate the candidate.