Antisymmetrized Molecular Dynamics Calculations*

Most sophisticated dynamical calculation to simulate nuclear collision between heavy ions.
Incorporate individual nucleon-nucleon interactions in the mean-field of the remaining nucleons
~10 min to simulate a collision with A=50 nucleons; CPU time scales as $A^3$
To understand how rare isotopes are produced, we measured the fragments emitted in the collisions of $^{40}\text{Ca}+^{9}\text{Be}$, $^{48}\text{Ca}+^{9}\text{Be}$, $^{58}\text{Ni}+^{9}\text{Be}$, $^{64}\text{Ni}+^{9}\text{Be}$ systems at the NSCL and compare to AMD predictions.
Simulations for these systems are performed at the High Performance Computing Center. For each system, we need ~ 20,000 events (~ 17 days, using 8 cpu’s in parallel).

Fragmentation cross section of Sulfur isotopes compared to AMD calculation results. Discrepancy in the case of $^{48}\text{Ca}+^{9}\text{Be}$ may show sensitivity to the isospin dependent level density assumptions.

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*This project constitutes part of the thesis of Michal Mocko