Dipole Transport in Multi-fragmentation

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$$D_z = \sum_{i=1}^{A_{Qp}} m_i p_{z_i}$$

where $m_i = \frac{(N_i - Z_i)}{A_i}$ of each fragment $(N, Z)_i$. The purpose of our analysis is to understand if the excess of neutrons leave the system with the gas, liquid or both. In order to achieve this goal we will study separately $p, n, ^3He, ^t$ and heavier particles for the gas and the liquid components, respectively. In an equilibrated system the ITD is centered at zero, and its fluctuations are connected to the temperature. Collective effects, such as the Dipole dependence on the symmetry energy and the Coulomb field, may result in a non zero Dipole value. The ITD will be studied for different excitation energies to point out possible phase transitions, similar to those observed in the GDR of high $E^*$. Moreover, the study of different reaction systems will give hints on the role of neutrons, protons and heavier fragments in achieving equilibrium.