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Dipole Transport in Multi-fragmentation GIACOMO BONASERA, Texas A&M University — The study of the Giant Dipole Resonance (GDR) in nuclei at low excitation energies (E*) gives access to information on the symmetry energy. Similarly the Isospin Transport Dipole (ITD) can be used to study the migration of protons and neutrons in a heavy ion collision at higher E*. Likewise to the Dipole mode definition used in GDR studies, we define a Dipole mode as:$D_z = \sum_{i=1}^{A_{Qp}} m_i p_{zi}$ 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 $p, n,{}^{3}He,t$ 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.

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