Determination of the Isovector Equation-of-State in Heavy Ion Collisions *

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The isovector part of the nuclear equation-of-state (EOS), i.e. its density and momentum dependence away from saturation density and Fermi momenta, is not well constrained from experiments and is very differently predicted by many body theories. However, it is of great importance in many respects, as in the structure and collective dynamics of exotic nuclei, in the isospin part of the optical potential and the effective masses, in the nature of the liquid-gas phase transition and in astrophysical phenomena like the neutron star structure and cooling behavior. One way to obtain more information is in heavy ion collisions of asymmetric nuclei, observing the isospin transport between the various ejectiles. In this contribution we will discuss the different phenomena, the most sensitive observables and the results of transport calculations. At Fermi energies the iso-EOS can be studies at low densities in the fractionation of isospin in fragmentation reactions, i.e. in the isotopic yield distributions. At high energies and compression above normal density one can investigate proton/neutron differential flow and stopping as well as production of charged mesons, in particular π- and K-mesons. We shall discuss the sensitivity to various assumptions on the iso-EOS and the present conclusions.

* This work is supported by the BMBF Germany, contract 06LM189.