

## PROTON-PROTON CORRELATION FUNCTIONS AS A PROBE TO THE DENSITY DEPENDENCE OF THE SYMMETRY ENERGY

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IBUU transport simulations predict that proton-proton (pp) correlation functions are sensitive to the density dependence of the symmetry energy (Chen et al,2003). In an experiment at the NSCL, light charged particles were detected from  $^{40}\text{Ca}+^{40}\text{Ca}$  and  $^{48}\text{Ca}+^{48}\text{Ca}$  reactions, both at 80 MeV/A, using a high resolution array (HiRA). This array detects light particles with excellent energy (200 keV) and angular resolution ( $.2^\circ$ ) needed for precision measurements of correlations. These pp correlation functions, measured in central collisions, display an interesting dependence on the angle of the total momentum vector of the two protons. At forward angles, where the correlation function is sensitive to the projectile spectator, the correlation function appear consistent with a source very extended in space time. At backward angles, where it is sensitive to the participant expanding source, the source is actually more compact. A BUU transport model developed by Pawel Danielewicz has been used to try to reproduce the trends we see in data. It reproduces the source size at backward angles well, but underpredicts the size of the source at forward angles. BUU was used to explore the dependence on the symmetry energy and in-medium cross section reduction.