
Contribution ID: **307** Type: **Poster Presentation**

# Influence of the neutron skin effect on nuclear isobar collisions at RHIC

*Monday 4 November 2019 17:40 (20 minutes)*

The unambiguous observation of a Chiral Magnetic Effect (CME)-driven charge separation is the core aim of the isobar program at RHIC consisting of $^{96}_{40}$Zr+$^{96}_{40}$Zr and $^{96}_{44}$Ru+$^{96}_{44}$Ru collisions at $\sqrt{s_{\rm NN}} = 200$ GeV.We quantify the role of the isobars spatial distributions on both the eccentricity and the magnetic field strength within a relativistic hadronic transport approach (SMASH).In particular, we introduce isospin-dependent nucleon-nucleon spatial correlations in the geometric description of both nuclei, deformation for $^{96}_{44}$Ru and the so-called neutron skin effect for the neutron-rich isobar i.e. $^{96}_{40}$Zr.The main result of this study is a reduction of the magnetic field strength difference between $^{96}_{44}$Ru+$^{96}_{44}$Ru and $^{96}_{40}$Zr+$^{96}_{40}$Zr from $10\%$ to $5\%$ in peripheral collisions when the neutron-skin effect is included.Further, we find an increase up to 10\% of the eccentricity when deformation is taken into account while neither the neutron skin effect nor the nucleon-nucleon correlations result into a significant modification of this observable with respect to the traditional Woods-Saxon modeling.Our results suggest a smaller CME signal to background ratio for the experimental charge separation measurement in peripheral collisions with the isobar systems than previously expected.

**Author:** HAMMELMANN, Jan

**Co-authors:** ELFNER, Hannah; Dr ALVIOLI, Massimiliano (CNR-IRPI); STRIKMAN, Mark (Pennsylvania State University (US)); SOTO ONTOSO, Alba (Brookhaven National Lab)

**Presenter:** HAMMELMANN, Jan

**Session Classification:** Poster Session

**Track Classification:** Chirality, vorticity and spin polarization