



Contribution ID: 42

Type: Oral

Implementation and Validation of a (2+1+1)-Flavour Equation of State in the Heavy-Ion Event Generator *Trajectum*

Trajectum is a relativistic hydrodynamics code, designed to simulate the behaviour of the Quark-Gluon Plasma (QGP) produced during heavy-ion collisions using a hydrodynamic model. Given that the QGP undergoes hadronization as the temperature decreases, a hybrid equation of state (EoS) is required, combining one that is calculated from lattice QCD (LQCD) with one that describes a hadron resonance gas (HRG). In this work, the LQCD EoS calculated in (2+1)-flavours, which includes contributions from the up, down and strange quarks, is exchanged for a (2+1+1)-flavour LQCD EoS which additionally accounts for the charm quark. In addition, the interpolation method is changed from one that uses a ninth-order polynomial parameterized using the LQCD and HRG equations of state, to one that utilizes a connecting function previously employed in studies that incorporate a finite baryonic chemical potential. These changes are implemented into the broader *Trajectum* framework, and observables are generated using the modified code, which are then compared to their unmodified counterparts and observables from experiments to validate the modified event generator.

Primary authors: HARRIS, Liam (University of the Witwatersrand); Dr KOLBE, Isobel (University of the Witwatersrand); NIJS, Govert (CERN)

Presenter: HARRIS, Liam (University of the Witwatersrand)

Session Classification: Parallel - Theory

Track Classification: QCD and Theory Tools