Contribution ID: **222** Type: **Poster**

# The unexpected uses of a bowling pin: exploiting the extreme geometry of Ne-20 for hard probes

The question whether or not small systems form a QGP has remained unresolved for the past decade. In the soft sector, hydrodynamic modelling can describe experimental data, but with large error bars. In the near future, collisions of O-16 nuclei will provide new experimental data in a system which is theoretically under more control than for example pPb. However, theoretical uncertainties remain. In this work we propose to collide Ne-20 in addition to O-16. Ne-20 is of a similar size, but has a radically different shape. This shape difference allows for a precise control of the initial geometry of the QGP (if it is indeed formed), and therefore leads to a large cancellation of theoretical uncertainties in bulk observables. This allows for predictions from hydrodynamics to be made on the level of a few percent uncertainty, giving us a precision tool to understand whether small systems behave hydrodynamically. In addition, the radical difference in the shape of the QGP droplet between the two systems creates a different environment for hard probes to traverse. We will show how the path length traversed by hard probes is affected by this geometry.

## Category

Theory

## Collaboration

**Authors:** BALLY, Benjamin; Mr LU, Bing-Nan (GSCAEP, Beijing); PLUMBERG, Christopher (Pepperdine University); LEE, Dean; GIACALONE, Giuliano (Universität Heidelberg); NIJS, Govert Hugo (CERN); Prof. NORONHA-HOSTLER, Jacquelyn (University of Illinois Urbana Champaign); Mr EBRAN, Jean-Paul (CEA DAM and U. Paris Saclay); FROSINI, Mikael (CEA, DES, IRESNE, DER, SPRC, LEPh); Mr ROTH, Robert (Darmstadt Tech. U. and GSI); Mr ELHATISARI, Serdar (Gaziantep U. and Bonn U., HISKP); SHEN, Shihang (IAS, Julich); Mr DUGUET, Thomas (IRFU, Saclay and Leuven); Mr LÄHDE, Timo (IAS, Julie and JCHP, Julich); RODRIGUEZ, Tomas R. (Universidad Complutense de Madrid); Mr MEISSNER, Ulf-G. (Bonn U., HIHSKP, U. Bonn Phys. Inst., BCTP, IAS Julich, JCHP Julich, Tblisi State U.); Mr SOMÀ, Vittorio (IRFU, Saclay); Mr VAN DER SCHEE, Wilke (CERN, Utrecht U. and Nikhef); Mr MA, Yuan-Zhuo (Michigan State U.)

**Presenter:** NIJS, Govert Hugo (CERN)

**Track Classification:** 1. Jets modification and medium response