

# XVII Polish Workshop on Relativistic Heavy-Ion Collisions: Phase diagram and Equation of State of strongly interacting matter



Contribution ID: 14

Type: **not specified**

## Observation of top-quark pair production in heavy-ion collisions with the ATLAS detector

*Sunday 15 December 2024 12:00 (15 minutes)*

Measurements of top-quark pairs in heavy-ion collisions are expected to provide novel probes of nuclear parton distribution functions as well as to bring unique information about the time evolution of strongly interacting matter. We report the observation of top-quark pair production in proton-lead collisions at the centre-of-mass energy of 8.16 TeV in the ATLAS experiment at the LHC. Top-quark pair production is measured in the lepton+jets and the dilepton channels, with a significance well above 5 standard deviations in each channel separately. The nuclear modification factor is measured for the first time for the top-quark pair process. Also, the first observation of top-quark pair production in lead-lead collisions at the centre-of-mass energy of 5.02 TeV is reported. Top-quark pair production is measured in the  $e\mu$  channel, with a significance of 5.0 standard deviations. The result is compared to theory predictions based on different nuclear PDF sets.

**Authors:** BADEA, Anthony (University of Chicago (US)); GRABOWSKA-BOLD, Iwona (AGH University of Krakow (PL)); KVITA, Jiri (Palacky University (CZ)); SCHOTT, Matthias (CERN / University of Mainz); POTEPA, Patrycja Anna (AGH University of Krakow (PL)); BARON, Petr (Palacky University (CZ)); MONDAL, Santu (Czech Technical University in Prague (CZ)); BULANOWSKA, Weronika Emilia (AGH University of Krakow (PL)); VOLKOTRUB, Yuriy (Jagiellonian University)

**Presenter:** POTEPA, Patrycja Anna (AGH University of Krakow (PL))

**Session Classification:** Session 3