

Table of Contents

Physics opportunities with heavy ions at FCC-hh.....	1
Contribution to 2016 FCC-hh Physics Report.....	1
Workshops and meetings.....	1
Accelerator aspects.....	1
Physics topics.....	1
Saturation and small-x.....	1
Hard probes.....	2
Soft sector.....	2
Photon-induced collisions and connection with cosmic rays.....	2
General documents, presentations.....	2

Physics opportunities with heavy ions at FCC-hh

This sub-group of the FCC physics program focusses on studies with heavy ions.

Conveners: Nestor Armesto, Andrea Dainese, Silvia Masciocchi, Carlos Salgado, Urs Wiedemann

Basic parameters for HI collisions at FCC

Contribution to 2016 FCC-hh Physics Report

- Heavy ion contribution to the FCC-hh 2016 Physics Report: [arxiv:1605.01389](#)

Workshops and meetings

- 5th workshop, CERN, September 29, 2017
- Informal meeting on physics report, CERN, November 26, 2015
- HF discussion, ECT* Trento, March 20, 2015
- 4th workshop, CERN, September 22-23, 2014
- 3rd workshop, CERN, April 10, 2014
- 2nd workshop, CERN, January 29, 2014
- 1st workshop, CERN, December 16-17, 2013

Accelerator aspects

- Latest estimates of heavy-ion performance, in section 2 of the 2016 report: [arxiv:1605.01389](#)
- Potential performance of the FCC of heavy ions (M. Schaumann, J. Jowett. September 22, 2014): [slides](#), [paper](#)
- Contribution to the FCC Kick-off meeting (M. Schaumann. February 14, 2014) [slides](#)
- A first look at heavy ion operation of the FHC (M. Schaumann, J. Jowett. December 16, 2013) [slides](#)

Physics topics

Saturation and small-x

Contact persons: Nestor Armesto, Marco van Leeuwen

- Saturation and small-x at the LHeC (N. Armesto) [slides](#)
- Experimental possibilities for small-x at the LHC and higher energies (M. van Leeuwen) [slides](#)
- Nuclear PDFs at the LHC and beyond (C. Salgado) [slides](#)
- Small-x (N. Armesto) [slides](#)
- Proton PDFs at FHC and first thoughts about nuclear PDFs (J. Rojo) [slides](#)
- Predictions for multiplicities and single inclusive hadrons in saturation approaches (H. Fujii) [slides](#)
- Photon, photon-hadron and di-photon production in the saturation approaches at the FCC (A. Rezaeian) [slides](#)
- Nuclear pQCD at the FCC energies (H. Paukkunen) [slides](#)
- t and t-bar production in pp, pPb, PbPb and constraints on nuclear PDFs (D. d'Enterria, K. Krajczar, H. Paukkunen): [slides](#), [paper](#)

Hard probes

Contact persons: Andrea Dainese, Christof Roland, Carlos Salgado

- Hard scattering cross sections
 - ◆ Total cross sections with MCFM (C. Salgado): slides [☞](#)
 - ◆ t and t-bar production in pp, pPb, PbPb and constraints on nuclear PDFs (D. d'Enterria, K. Krajczar, H. Paukkunen): slides [☞](#), paper [☞](#)
- Boosted t-tbar events as probes of the QGP time evolution (L. Apolinario, N. Armesto, G. Milhano, C. Salgado): slides [☞](#)
- Thermal (or secondary) charm production in the QGP
 - ◆ Role of charm in the QGP equation of state (M. Laine, S. Borsanyi, C. Schmidt, MP. Lombardo): dedicated workshop [☞](#)
 - ◆ Secondary charm production at LO in BAMPS (J. Uphoff): slides [☞](#)
 - ◆ Secondary charm production at NLO (C.M. Ko): slides [☞](#)
 - ◆ Secondary charm production at NLO (P. Zhuang and K. Zhou): slides [☞](#)

Soft sector

Contact person: Urs Wiedemann

- Nucleus-nucleus collisions and QGP: parametric extrapolations (U. Wiedemann) slides [☞](#)
- Collective effects in small systems - EPOS approach (T. Pierog) slides [☞](#)
- Hadron production and the QCD phase boundary (P. Braun-Munzinger): slides [☞](#)
- Collision energy dependence of anisotropic flow and the temperature dependence of eta/s (G. S. Denicol) slides [☞](#)
- Flow measurements with multi-particle correlations (A. Bilandzic) slides [☞](#)

Photon-induced collisions and connection with cosmic rays

Contact Person: David d'Enterria

- Photon-induced collisions and connection with cosmic rays (D. d'Enterria): slides [☞](#)
- Photon-photon collisions at FCC (D. d'Enterria): slides [☞](#)
- Electro-magnetic process at FCC (R. Schiker): slides [☞](#)

General documents, presentations

- Heavy ion contribution to the FCC-hh 2016 Physics Report: arxiv:1605.01389 [☞](#)
- A. Dainese, FCC Week talk, Apr 2016: slides [☞](#)
- N. Armesto, QM2015 talk, Sep 2015: slides [☞](#)
- M. Ploskon, FCC Week talk, Mar 2015: slides [☞](#)
- M. Schaumann, Potential performance for Pb-Pb, p-Pb and p-p collisions in a future circular collider arxiv:1503.09107 [☞](#)
- A. Dainese, seminar at INT-Seattle, Nov 2014: slides [☞](#)
- A. Dainese, QM2014 talk, May 2014: slides [☞](#)
- Proceedings of QM2014 talk: Armesto et al. arxiv:1407.7649 [☞](#)

-- AndreaDainese - 2015-10-21

This topic: LHCPHysics > HeavyIons

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