

# **Particle Physics Day 2017**

## **Report of Contributions**

Contribution ID: 5

Type: **not specified**

## QCD theory overview

*Friday 20 October 2017 11:00 (25 minutes)*

**Presenter:** LAPPI, Tuomas (University of Jyvaskyla)

**Session Classification:** QCD session

Contribution ID: 6

Type: **not specified**

## ALICE experimental overview

*Friday 20 October 2017 11:30 (25 minutes)*

**Presenter:** KIM, Dong Jo (University of Jyvaskyla (FI))

**Session Classification:** QCD session

Contribution ID: 7

Type: **not specified**

## Particle cosmology theory overview

*Friday 20 October 2017 13:30 (25 minutes)*

**Presenter:** KEUS, Venus (University of Helsinki)

**Session Classification:** BSM session

Contribution ID: 8

Type: **not specified**

## **CMS+TOTEM experimental overview**

*Friday 20 October 2017 14:00 (25 minutes)*

**Presenter:** KIRSCHENMANN, Henning (Helsinki Institute of Physics (FI))

**Session Classification:** BSM session

Contribution ID: 9

Type: **not specified**

## Non-perturbative study of Electroweak Phase Transition in BSM models

*Friday 20 October 2017 14:30 (12 minutes)*

Electroweak Phase Transition is frequently studied perturbatively by using finite T effective potential. In this talk, we remind how non-perturbative analysis can be performed and discuss our findings and their implications.

**Presenter:** TENKANEN, Tuomas

**Session Classification:** BSM session

Contribution ID: 10

Type: **not specified**

## Search for charged Higgs bosons in the CMS experiment

*Friday 20 October 2017 14:45 (12 minutes)*

The Standard Model is one of the most successful theories of our time, but there still appear problems in the theory. One way to overcome these problems is an extended scalar sector. By adding an additional scalar doublet to the Standard Model we can predict in total five Higgs bosons instead of one and two of these are charged. At CERN LHC the charged Higgs bosons ( $H^\pm$ ) are searched for and the production mode depends on the mass of the charged boson. If the charged Higgs boson is lighter than the top quark mass the production happens through  $t \rightarrow H^\pm b$ , but  $H^\pm$  that are heavier than a top quark can be produced through  $t\bar{b} \rightarrow H^\pm$ . This talk considers the fully hadronic final state of  $H^\pm \rightarrow \tau\nu$  and the analysis used in the search will be presented. The talk will also give an overview of the expected limits for the production of the charged Higgs boson with 13 TeV and 35 fb $^{-1}$ , covering the mass range of 80-3000 GeV.

**Presenter:** LOTTI, Mikko (Helsinki Institute of Physics (FI))

**Session Classification:** BSM session

Contribution ID: 12

Type: **not specified**

## EPPS16 –First nuclear PDFs to include LHC data

*Friday 20 October 2017 12:00 (8 minutes)*

We present results of our recent EPPS16 global analysis of NLO nuclear parton distribution functions (nPDFs). For the first time, dijet and heavy gauge boson production data from LHC proton–lead collisions have been included in a global fit. Especially, the CMS dijets play an important role in constraining the nuclear effects in gluon distributions. With the inclusion of also neutrino–nucleus deeply-inelastic scattering and pion–nucleus Drell–Yan data and a proper treatment of isospin-corrected data, we were able to free the flavor dependence of the valence and sea quark nuclear modifications for the first time. This gives us less biased, yet larger, flavor by flavor uncertainty estimates. The EPPS16 analysis indicates no tension between the data sets used, which supports the validity of collinear factorization and universal nPDFs for nuclear hard-collision processes in the kinematical range studied.

**Presenter:** PAAKKINEN, Petja (University of Jyväskylä)

**Session Classification:** QCD session



Contribution ID: 13

Type: **not specified**

## Deep inelastic scattering in the dipole picture at next-to-leading order

*Friday 20 October 2017 12:10 (8 minutes)*

We study quantitatively the importance of the recently derived NLO corrections to the DIS structure functions at small  $x$  in the dipole formalism. We show that these corrections can be significant and depend on the factorization scheme used to resum large logarithms of energy into renormalization group evolution with the BK equation. This feature is similar to what has recently been observed for single inclusive forward hadron production. Using a factorization scheme consistent with the one recently proposed for the single inclusive cross section, we show that it is possible to obtain meaningful results for the DIS cross sections.

**Presenter:** HANNINEN, Henri Johannes (Helsinki Institute of Physics (FI))

**Session Classification:** QCD session

Contribution ID: 14

Type: **not specified**

## **Linear and non-linear flow mode in 5 TeV Pb-Pb**

*Friday 20 October 2017 12:20 (8 minutes)*

**Presenter:** PARKKILA, Jasper (University of Jyvaskyla (FI))

**Session Classification:** QCD session

Contribution ID: 15

Type: **not specified**

## Holography theory overview talk

*Friday 20 October 2017 15:30 (25 minutes)*

**Presenter:** Dr JOKELA, Niko

**Session Classification:** OTH session

Contribution ID: **16**

Type: **not specified**

## Neutrino physics experimental overview

*Friday 20 October 2017 16:00 (25 minutes)*

**Presenter:** LOO, Kai Krister (University of Jyvaskyla (FI))

**Session Classification:** OTH session

Contribution ID: 17

Type: **not specified**

## Constraints to Triplet Higgs model from oscillation experiments

*Friday 20 October 2017 16:30 (12 minutes)*

The triplet scalars, predicted by the left-right symmetric  $SU(2)_L \times SU(2)_R \times U(1)$  model and utilized in Type II seesaw model to explain the lightness of neutrinos, would generate nonstandard interactions (NSI) for neutrino propagating in matter. The bounds for NSI would then translate into constraints on the triplet Higgs model. I introduce the model and present current bounds and bounds improved by DUNE, the future long baseline neutrino oscillation experiment.

**Presenter:** KARKKAINEN, Timo Johnny (Helsinki Institute of Physics (FI))

**Session Classification:** OTH session

Contribution ID: **18**Type: **not specified**

## Neutrino oscillations in BSM physics

*Friday 20 October 2017 16:45 (12 minutes)*

Following the celebrated discovery of neutrino oscillations, it became clear that the Standard Model had acquired yet another problem it could not explain: the origin of neutrino mass. Over the last few decades neutrino physics has seen an amazing progress, and very recently the field entered a new era, where properties of the standard three-neutrino paradigm can be tested to a high precision. In this talk I will make a very briefly review on what the recent and near-future developments in neutrino oscillation physics could teach us about what could possibly lie beyond the Standard Model.

**Presenter:** VIHONEN, Sampsa**Session Classification:** OTH session