DEPARTMENT OF PHYSICS
PANJAB UNIVERSITY
CHANDIGARH
SIX-MONTHLY PROGRESS REPORT
PROFORMA FOR Ph.D. CANDIDATES

01.07.2014 to 31.12.2014
(To be submitted bi-annually by June, 30th and December, 31st)

1. Name of the candidate: Anterpreet Kaur
2. Faculty : Science
3. Department : Physics
4. Enrollment No. and Date : 13/1033 , 10-04-2013
5. Registration No. and Date : N.A.
6. Tentative/Approved Title : Synopsis not submitted yet
7. A summary of the work done during the last six months (Depending upon the stage of Ph.D. work) providing details of (i) Review of Literature (ii) Experimentation/Data Collection, Field work (iii) Data Processing (iv) Data Analysis and Interpretation and (v) Stage of thesis writing with specific reference to the goals set for the previous 6 months. (Separate sheet attached)
8. Did you complete the tasks and achieve the goals you had set for the period under report ?
   Yes/No : Yes
   If No : Difficulties, Constraints faced in achieving the objectives that had been formulated for the period under report.
9. Publications if any : N.A.

Certificate :

It is certified that the information provided above is correct to the best of my knowledge. I shall try my best to achieve the above targets during the next six months.

Name of the Candidate : Anterpreet Kaur

Signature :

Certificate:

Progress report of the candidate : Satisfactory/Unsatisfactory/Need to be improved

Supervisor Name : Prof. Manjit Kaur

Signature :

Counter –Signature of the Chairperson

PROGRESS REPORT

The inclusive jets and their properties are studied in details. The inclusive implies that all jets passing the relevant kinematic cuts are considered. The proton-proton collisions data collected during 2012 at a centre-of-mass energy of 8 TeV with the CMS detector at the LHC is used. The CMS software framework with version CMSSW_5_3_11 and Global Tag 12FT_53_V21_AN6 has been used for the present study. For Monte Carlo (MC) studies, the MADGRAPH generator is used because of its treatment of hard and well-separated partons. So far various jet properties such as transverse momentum (pT), rapidity (y) and azimuthal angle (Φ) have been studied and compared with the predictions from MC predictions. After applying jet tight ID cut, finally events with one or more jets having $pT > 50$ GeV and $|y| < 2.5$ are selected. In QCD, the events have low level of missing energy, so a cut on ratio of missing transverse energy to that of total transverse energy i.e. $E_T^{miss} / \sum E_T < 0.3$ is applied to select clean QCD events.

Other Activities :

- We successfully tested two more sets of PM/APM (Power Mezzanines/Auxiliary Power Mezzanines) for 39 hours continuously, which will be then used in μHTR (HCAL Trigger/Readout) cards.

- I gave a presentation under the title 'MultiJet Cross-section Ratios at 8 TeV' in India CMS Meeting held at Delhi University on 4^{th} - 5^{th} November, 2014.

Goals for the next six months :

- After the complete understanding of the data in terms of these observables, various corrections such as jet energy correction (JEC), jet energy scale (JES) will be applied. The corrections due to the detector resolution will be understood and implemented by using the unfolding technique.

- A μTCA set-up for testing of μHTR cards will be installed at Panjab University.

- To participate in the testing and installation of μHTR cards.

- To attend various talks and lecture programs that would be helpful for my Ph.D degree.

ANTERPREET KAUR,
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