CHAPTER 6

CONCLUSION AND OUTLOOK

Reconstruction of D^0 meson at centre-of-mass energy ($\sqrt{s}$) of 13 TeV was done with the same cut values for reconstruction at Run 1 data ($\sqrt{s}$ =7 TeV) and modified cut values at several p_T intervals. At p_T interval of 12< p_T <16 GeV/c, the mass peak was not very obvious because of insufficient entries. At p_T intervals of 1< p_T <2 GeV/c and 4< p_T <5 GeV/c however, the mass peak was prominent. Compared to reconstruction of D^0 at $\sqrt{s}$ =7 TeV, the reconstruction at $\sqrt{s}$ =13 TeV shows more scatter of entries around the fit line. This may suggest that there are differences in background between the two centre-of-mass energies that could not be fitted the same way. However, as the reference paper [10] does not provide any significance value, no significance comparison could be made between the two.

The same cut values applied in Run 1 ($\sqrt{s}$ =7 TeV) is also capable of reconstructing D^0 at $\sqrt{s}$ =13 TeV. However it could not achieve high significance at p_T interval of 1< p_T <2 GeV/c. The modified cut values are able to achieve a higher significance and signal yield at 1< p_T <2 GeV/c. However the significance is not yet above 5.

There are 1,417 $\pm$ 87 D^0 meson counted after selection cuts at p_T intervals of 1< p_T <24 GeV/c in this final project, compared to about 8,400 D^0 meson in the reference paper [10].

Although reconstruction was able to be done in this final project, the signal yield, due to the small size of the dataset, was not large enough to be used to calculate cross section of D^0 meson at centre-of-mass energy of 13 TeV. However, the results of this final project could be used as a basis to do reconstruction of D^0 meson with different dataset taken at Run 2. Other datasets that could be used are datasets 16k and 16o. Combining with dataset 16l (used in this analysis), there are 308 million minimum bias events. Comparable to dataset used in Run 1 that contains 314 million minimum bias events.

When reconstruction of D^0 meson is done using all available minimum bias events recorded by ALICE is done, cross section of D^0 meson can be calculated and measured with better precision.

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