To Farid,

My choice of assignment for the final project is: Excited gravitons in 4lepton final states (G\*->ZZ->l+l-l+l-). The original thought was to the following:

Is there anything in the OpenData from ATLAS that suggests a graviton component could exist?

Plan for work:

- Read about graviton. It's theoretical foundation. Competing ideas. If no observation of graviton is seen Atlas open data, try to investigate the theoretical foundation for graviton in the Standard Model and the new Physics thinking. What can be changed to introduce graviton (my thoughts).

- Investigate similar papers on graviton and search for it in the ATLAS Open Data. Whether they exist or not.

- Search for graviton in Open Data from ATLAS

- Conclude on your findings

- Write a scientific report with Introduction, Theory, Experiment/Method, Result, Conclusion parts.

That is the plan and motivation at least. Furthermore, I would use the code that already exists in the module, and of course tweak it a bit to be relevant for graviton. I would use Python. And also CompHEP for necessary Feynman diagrams/processes. When it comes to literature I think I must make a sweep, but I know you have worked on gravitons before. And there is other research out there on InspireHEP.

I presume there won’t be much to be found on graviton in the Open atlas data, and therefore expect to work on the theoretical aspect for the search for graviton in addition to the coding. Variables interested are the 4 leptons.

Content plan:

Introduction

Theory

* Graviton
* Atlas Open Data
* Previous research
* Introduction to simulation used

Method

Result

Discussion

Of the result from the Atlas Open Data, if proof of graviton is to be seen or not

Investigation of the theoretical foundation of graviton

Conclusion