

# Ba. Thesis Progress Log

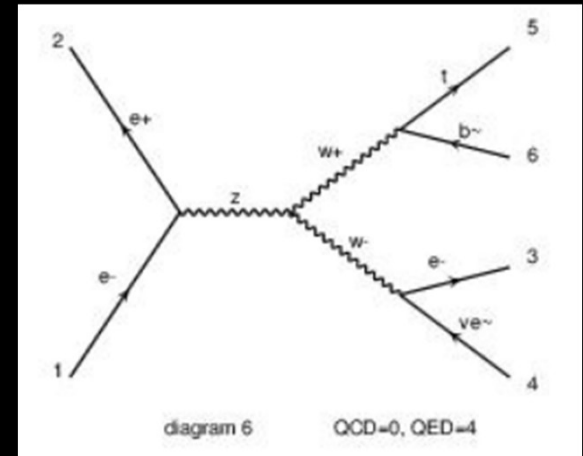
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# First Steps: Framework Account, SSH

- First, got an account in the ETP framework and access to the portal/... machines
- Set up and roughly learned on how to use the account through the documentation of the ETP Wiki
- All sorts of documentation and important files are uploaded and kept on the gitlab:
  - <https://gitlab.etp.kit.edu/rdeandrade/ba-thesis/-/tree/main>

# First Steps: Madgraph

- Installed Madgraph and ran ist tutorial
- Had many runs of the single top decay but also of other processes
- On that time, also installed and tried out Madanalysis
- Documentation: [https://gitlab.etp.kit.edu/rdeandrade/ba-thesis/-/blob/main/documentation/mdgrph\\_documentation.md](https://gitlab.etp.kit.edu/rdeandrade/ba-thesis/-/blob/main/documentation/mdgrph_documentation.md)



Example Feynmann Diagram for a single top decay generated by Madgraph

# Recommended Articles

- I've been given two different articles more or less loosely related to the single top decay.
- Both were read and summaries , as well as open questions, were documented on the Gitlab
  
- STUDY OF SINGLE TOP PRODUCTION AT HIGH ENERGY ELECTRON-POSITRON COLLIDERS: <https://arxiv.org/pdf/1411.2355>
- Probing Top Quark Electroweak Couplings at the FCC-ee (Ba. Thesis)

# Delphes and Pythia

- Installation of Pythia and Delphes were not successful at first
- After a lot of help and some tryouts, Delphes was successfully installed 'manually'
- Additionally, learned how to run them through fccstack
  
- 'Manual' use of PythDelph: [https://gitlab.etp.kit.edu/rdeandrade/ba-thesis/-/blob/main/documentation/pythdelph\\_manual\\_documentation.md](https://gitlab.etp.kit.edu/rdeandrade/ba-thesis/-/blob/main/documentation/pythdelph_manual_documentation.md)
- PythDelph through FCC stack: [https://gitlab.etp.kit.edu/rdeandrade/ba-thesis/-/blob/main/documentation/pythdelph\\_fccstack\\_documentation.md](https://gitlab.etp.kit.edu/rdeandrade/ba-thesis/-/blob/main/documentation/pythdelph_fccstack_documentation.md))

# Documentation

- Written down documentations about how to install or use certain programs, e.g. Madgraph, Delphes
- Made documentations for Linux, VIM and Root commands that could be useful ("Cheat Sheet")
- Linux, VIM and ROOT Documentation: [https://gitlab.etp.kit.edu/rdeandrade/ba-thesis/-/blob/main/documentation/commands\\_documentation.md](https://gitlab.etp.kit.edu/rdeandrade/ba-thesis/-/blob/main/documentation/commands_documentation.md)
- How to install MADGRAPH, PYTHIA and DELPHES: [https://gitlab.etp.kit.edu/rdeandrade/ba-thesis/-/blob/main/documentation/installation\\_documentation.md](https://gitlab.etp.kit.edu/rdeandrade/ba-thesis/-/blob/main/documentation/installation_documentation.md)

# Ongoing: using ROOT in Python

- I've been shown on how to use Root files that are given by Delphes in python to actually process them.
- Currently trying out and learning on using them properly