

1 Introduction

This course is taught in English. There are some good reasons for this.

1. My knowledge of Spanish is enough for just talking, but I don't know all the physics words (many of these words I don't even know in Dutch, my native language). In addition I would have to think more about the proper use of the language than about the physics.
2. English has become the international language of science. In your further career it will be inevitable that you will have to use English. Better get used to it as soon as possible.
3. I couldn't possibly make the lecture notes in proper Spanish.

If there is something you don't understand, either because of the physics, or because of the language, please ask. You will do yourself a disservice if you spend the rest of the hour not understanding what is going on.

As a first step in this course you will have to register by e-mail. This means that you will have to send me an e-mail at the address `t68@nikhef.nl` and get an answer to the mail. This way we both know that you can ask questions and send your homework without the risk that the mail disappears into some spam filter. *If you don't do this, I will assume that you don't want a grade in the course.*

When you send me questions or homework, please use plain text files as much as possible. I don't like .doc files. If you like to include formulas in fancy typesetting or graphs, please present the results as a .pdf file.

In this course we will see how to compute crosssections and decay modes from the purely utilitarian point of view. Many formulas will not be derived; they will just be given and a derivation either has been given in or will have to wait for a more formal course. It is assumed that you have access to a computer running Linux. We will use the symbolic program FORM and the C compiler. In addition we may use the \LaTeX typesetting program and a number of libraries. The C compiler and the \LaTeX system come with the Linux system. If you don't have FORM on your computer, you can pick it up from the FORM distribution site: <http://www.nikhef.nl/~form> where you can look for the appropriate binary and the manual. There are also various sample programs. All libraries and support programs that we will be using can be found there as well. If you have problems installing the programs please ask either a fellow student or ask me. Don't continue without these programs, because you will have to do the homework in order to pass the course¹.

Some results are made visible with the use of \LaTeX and axodraw². The $\text{\TeX}/\text{\LaTeX}$ system is part of a complete Linux distribution and axodraw can be obtained from the FORM site as well. What we use here is just an example

¹I do know that some of the homework is hard. Trying is at least as important as getting it perfect.

²If you ever have to prepare documents with axodraw figures, it is most convenient to use the Java front-end program named Jaxodraw. The Jaxodraw/axodraw combination is becoming more and more popular in theoretical particle physics

of how results can be presented. There exist much fancier systems, but these require the installation of considerably more software. The advantage of the libraries provided in this course is that they are rather simple and concise. This allows you to have a look at what is done inside and to have complete control over them, including altering them to suit your own taste.

Files from the FORM site that we will use:

- FORM. You will need the executable for the type of computer you are using. As we use Linux and 64-bits computers can also run 32-bits executables, usually the 32-bits Linux version should suffice. It sits at <http://www.nikhef.nl/~form/maindir/binaries/linux32/form>
- All files in <http://www.nikhef.nl/~form/maindir/courses/course8> and its subdirectories. Also the programs to which there are links will be needed. This directory will be regularly updated during the course.