

1 Introduction

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 all the practical exercises are based on them.

Some results are made visible with the use of \LaTeX and axodraw¹. 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 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/course2> and its subdirectories. Also the programs to which there are links will be needed. This directory will be regularly updated during the course.

Whenever there is a mention of homework in the following notes, this should be interpreted as: "try this yourself". This course is taught as a series of lectures in the morning and a sessions in which you have to do things yourself in the afternoon. The 'homework' is meant for the afternoon sessions. At first it will involve some more formal things but soon we will switch to you running programs and trying to modify them. If you make good progress, in the end you can made such programs by yourself.

¹If 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