

List of files and programs.

Files

The following files can be found at [pcna5802]/home/illorent:

NMR data are recorded in [pcna5802]/home/illorent/cdrom.

Listfiles containing only the names of the NMR data files in 'cdrom' are:

- **nmrlist** → Compass NMR data from 030624_025111.bgr to 030710_120145.sig.
- **nmrlistbis** → When the input file for the program disp_polfxc.C (using Jaakko's calibration constants, multiplying by the field correction factors, and using baselow=16350000Hz, basehigh=16410000Hz) is nmrlist, the output file giving the polarization in time for each coil is nmrlistbis.
- **nmrlist3bis** → When the input file for the program disp_polfxc.C (using Jaakko's calibration constants, dividing by the field correction factors, and using baselow=16350000Hz, basehigh=16410000Hz) is nmrlist, the output file giving the polarization in time for each coil is nmrlist3bis.
- **nmrlistk** → When the input file for the program disp_polfxc.C (using Kaori's calibration constants, dividing by the field correction factors, and using baselow=16350000Hz, basehigh=16410000Hz) is nmrlist, the output file giving the polarization in time for each coil is nmrlistk.
- **nmrlistk2** → When the input file for the program disp_polfxc.C (using Kaori's calibration constants, dividing by the field correction factors, and using new baselow=16341800Hz, and new basehigh=16421800Hz) is nmrlist, the output file giving the polarization in time for each coil is nmrlistk2.
- **nmrlistcd2** → Compass NMR data from 030513_185400.bgr to 030523_155043.sig.
- **nmrlistcd2bisbis** → When the input file for the program disp_polfxc.C (using Kaori's calibration constants, dividing by the field correction factors, and using new baselow = 16341800 Hz, and new basehigh = 16421800 Hz) is nmrlistcd2, the output file giving the polarization in time for each coil is nmrlistcd2bisbis. This file contains all data with positive magnetic field. It contains polarization build-up that can be plotted using the program mydisppolpm.C This plot was used to perform exponential fits in order to obtain the polarization build-up time for May 2003 (See tables 2 and 3).
- **nmrlistcd3** → Compass NMR data from 030614_000003.sig to 030620_235805.sig. (Background 030616_102828.bgr was added to the beginning of the list).
- **nmrlistcd3bis** → When the input file for the program disp_polfxc.C (using Kaori's calibration constants, dividing by the field correction factors, and using new baselow = 16341800 Hz, and new basehigh = 16421800 Hz) is nmrlistcd3, the output file giving the

polarization in time for each coil is `nmrlistcd3bis`. Part of this file contains polarization build-up data that can be used to obtain the polarization build-up time for June 2003 .

- **`nmrlistcd4`** → Compass NMR data from 030621_000006.sig to 030716_235911.sig. (Background 030620_185505.bgr was added to the beginning of the list).
- **`nmrlistcd4bis`** → When the input file for the program `disp_polfxc.C` (using Kaori's calibration constants, dividing by the field correction factors, and using new `baselow` = 16341800 Hz, and new `basehigh` = 16421800 Hz) is `nmrlistcd4`, the output file giving the polarization in time for each coil is `nmrlistcd4bis`. This file contains both parts of polarization build-up and of polarization decay.
- **`nmrlistbiscinco`** → Putting together the last part of `nmrlistcd3bis` and the first part of `nmrlistcd4bis`, we get this file that can be plotted using program `mydisppolpm.C` in order to see polarization build-up for June 2003. Exponential fits can be performed on this plot in order to find the polarization build-up time for each coil (See tables 4 and 5).
- **`nmrlistbisseis`** → Using most of `nmrlistcd4bis` polarization points except those at the beginning and at the end of the file, we get this file giving the polarization decay during about 450 hours, ie. nearly 19 days. This can be plotted using `mydisppolpm.C` or `disppolpm.C`, and exponential fits can be done in order to obtain the polarization decay time for each coil (See tables 6 and 7).
- **`pol2003average1`** → Contains average positive and negative polarization from 2003-May-13 to 2003-July-16.
- **`pol2003prerun`** → Contains average positive and negative polarization for 2003 prerun period, from 2003-May-13 to 2003-June-20.
- **`pol2003run`** → Contains average positive and negative polarization for 2003 run period from 2003-June-11 to 2003-July-16.
- **`cuatro1bis`, `cuatro2bis`, ... , `cuatro10bis`** Output files of program `backgrounds.C` (see next section) for coils 1, 2,...,10 respectively. They contain background characteristics for the period from 2003-June-20 to 2003-July-15. Programs `plotbac.C` and `plotbac2.C` can be used to plot these characteristics against time.
- **`todo1`, `todo2`, ... , `todo10`** Output files of program `backgrounds.C` (see next section) for coils 1, 2,...,10 respectively. They contain background characteristics for the period from 2003-May-13 to 2003-June-20. Programs `plotbac.C` and `plotbac2.C` can be used to plot these characteristics against time.
- **`all1`, `all2`, ... , `all10`** Output files of program `backgrounds.C` (see next section) for coils 1, 2,...,10 respectively. They contain background characteristics for the period from 2003-May-13 to 2003-July-15. Programs `plotbac.C` and `plotbac2.C` can be used to plot these characteristics against time.

Programs

- **monday4.C** → This program can be used to obtain graphs of the different stages of the process of NMR signal analysis (eg. background plot, signal minus background plot, baseline subtraction, etc).
- **disp_polfxc.C** → This program calculates the polarization from the NMR data and writes a '+'/'-' flag to the end of each line, depending on whether the magnet current is positive/negative.
- **disppolpm.C** → This program can plot data only with a certain magnet current sign, '+' or '-', so that analysis can be done using only positive or negative magnetic field data.
- **mydisppolpm.C** → Plots all data together, with both '+' and '-' flag, independently of the input sign entered through the keyboard.
- **averagepol.C** → Calculates the average polarization for all the positive coils (1 to 4) and for all the negative coils (6 to 10). Its input file can be any file that the program disp_polfxc.C outputs. The output file of program averagepol.C contains four columns with: time in unix seconds, average positive polarization, average negative polarization and magnet current sign.
- **plotaverage.C** → Plots the average polarization in time. Its input file can be any output file from the program averagepol.C.
- **backgrounds.C** → Fits the background files and calculates its characteristics. The input is a list-file containing the names of the background files to be analysed. For each background file, the output file will contain one line with: background file name, Unix time in seconds, width of background signal at 1/6 of its total height, peak frequency, p0, p0error, p1, p1error, p2, p2error, p3, p3error, standard deviation, gain, offset, and noise, all separated by spaces. The parameters that come from the background fit are: p0, which is the scaling factor, p1, which is the quality factor (Q), p2 that gives the peak frequency, p3 that gives the offset in the background fit. At the end, the program plots the last background with its fit on the top, and the last background vs. the reference background on the bottom, as an example.
- **plotbac.C** → Plots the output files of the program backgrounds.C. These files contain data for only one coil. Plots the peak frequency of the background files vs. time, the width of the background file (at 1/6 of its total height) vs. time, the gain vs. time, and the quality factor vs. time.
- **plotbac2.C** → Plots the output files of the program backgrounds.C. These files contain data for only one coil. Corrects the gain with the scaling factors coming from Jaakko's 'GainMay03' report and plots only the gain of all backgrounds vs. time. Correction with the scaling factors has to be done manually, changing the value in the program each time the inputfile corresponds to a different coil.