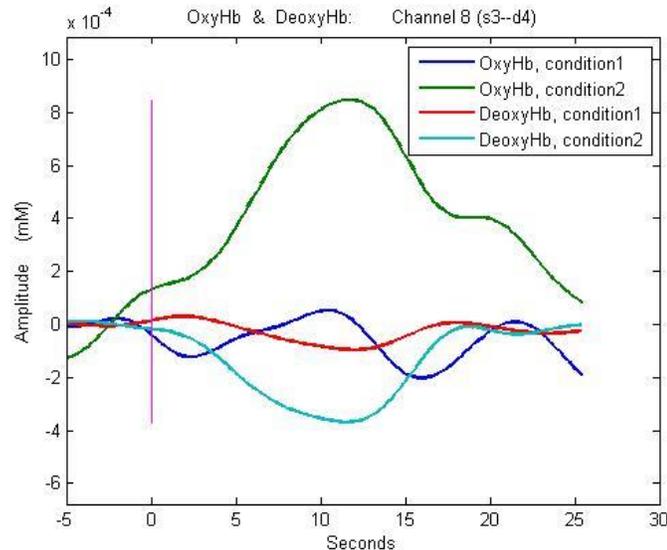


## About nirsLAB (v2014.12)

### What's new?

1. Revision v2014.12 of nirsLAB has both p-code and standalone executable versions. As in previous versions of nirsLAB, the p-code version, runs only on MATLAB platforms. The executable version of nirsLAB is a standalone Windows application, and can be run whether or not any version of MATLAB is installed. It is certified for operation under Windows 7 (you may find that you can successfully use it on platforms running other Windows versions, but this is not guaranteed).
2. A new function has been added to the **Experimental Data and Conditions** portal. It allows users to use nirsLAB to load and analyze experimental raw data from Biopac fNIRS data acquisition systems.
3. In this version of nirsLAB, the baseline means of the block-averaged hemodynamic-states time series are reset to zero. An example is shown in Figure 1 (“baseline” = the segment of the data that precedes the ‘Start’ marker at 0 seconds):

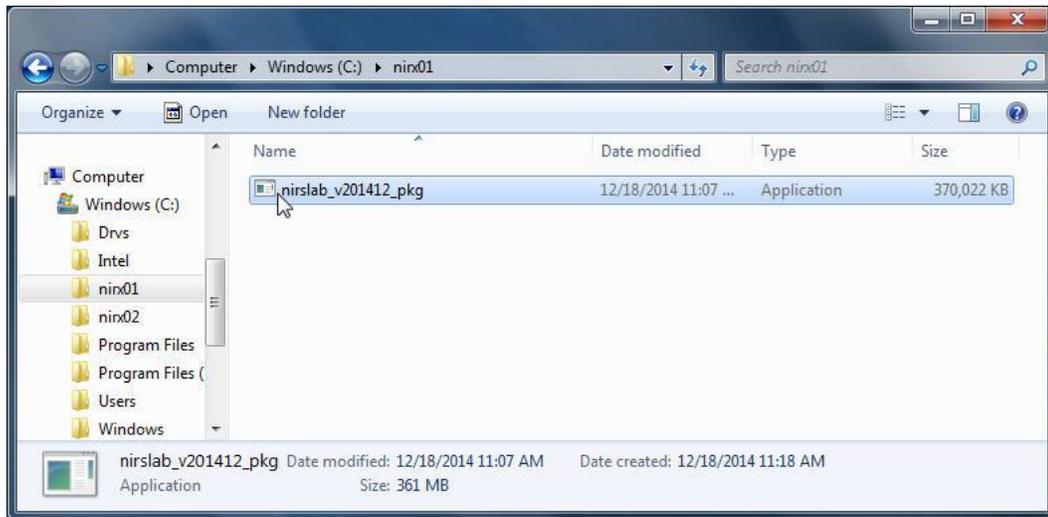


**Figure 1.** Example of block-averaged time series, demonstrating that the mean value is 0 in the pre-‘Start’ time interval in all instances.

4. This version of nirsLAB uses the binary codes in the event-marker file as the default names for experimental conditions. This is in contrast to previous versions, which simply named the conditions in the order in which they occur in the event file. The advantage of the new method is that it will automatically give the same condition name to the same binary code in all data sets of a multi-session study, even if the tasks/stimuli are presented in different orders in different sessions.
5. Several user-reported bugs have been corrected in this release. An example is that the previous versions’ level-2 SPM routine always computed F-test statistics, irrespective of whether users specified SPM{F} or SPM{t}.

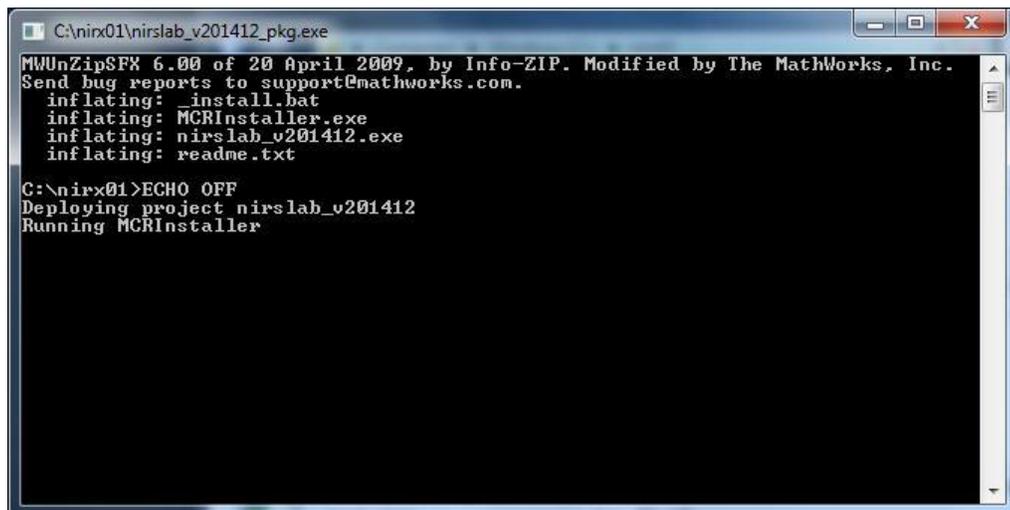
## How to install the executable version of nirsLAB

1. Create a new folder on the hard drive of your computer. In the example shown in Figure 2, a folder named 'nirx01' is created under drive C.
2. Place the self-extracting installation file, named 'nirslab\_v201412\_pkg.exe', into the folder created in Step 1.
3. Open Windows Explorer and navigate to the folder where the installation file is stored. Double-click on the installation file to automatically extract the executable nirsLAB file and install the MATLAB compiler runtime files that are packaged within the installation file, as indicated in Figure 2.

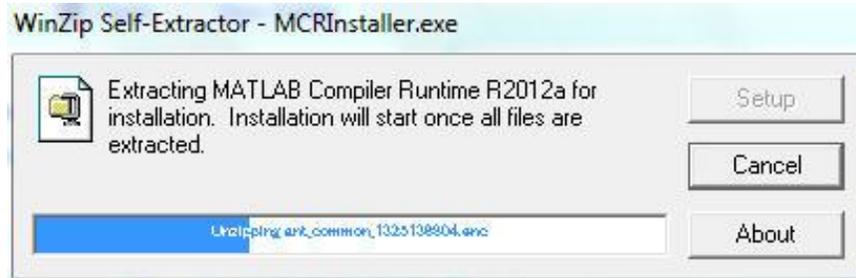


**Figure 2.** Recommended placement of the 'nirslab\_v201412\_pkg.exe' self-extracting installation file, into a new/empty folder.

4. A DOS command-prompt window and progress-bar window, similar to those in Figures 3 and 4, will open automatically. No further action on your part is required until Step 5.

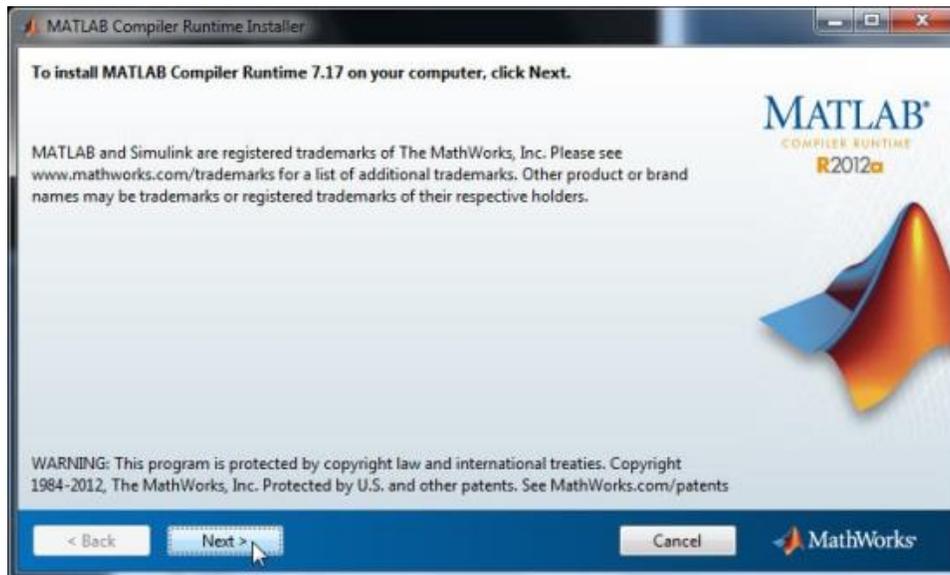


**Figure 3.** The DOS-prompt window that automatically opens when you launch the installation of the executable nirsLAB, as illustrated in Fig. 2.

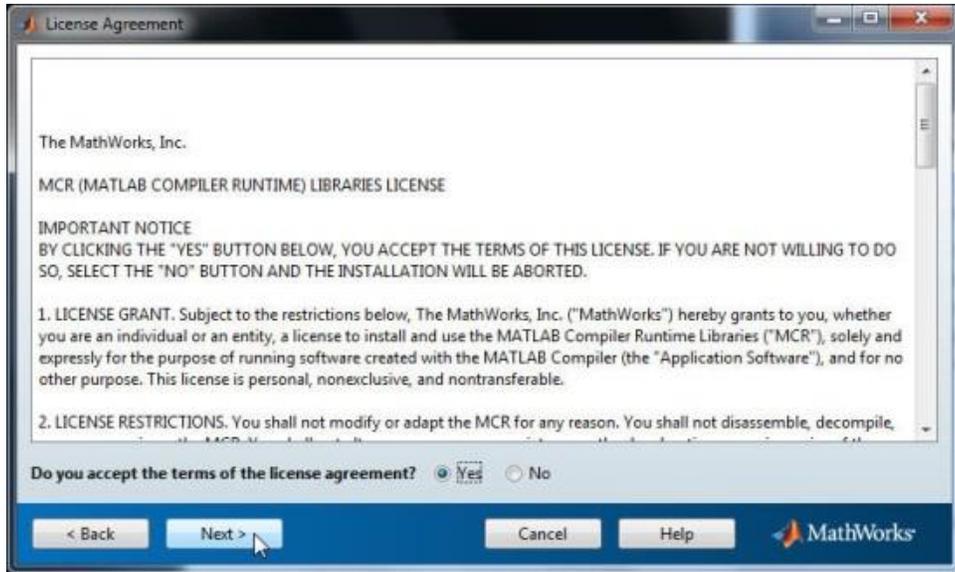


**Figure 4.** The progress-bar window that automatically opens when you launch the installation of the executable nirsLAB, as illustrated in Fig. 2.

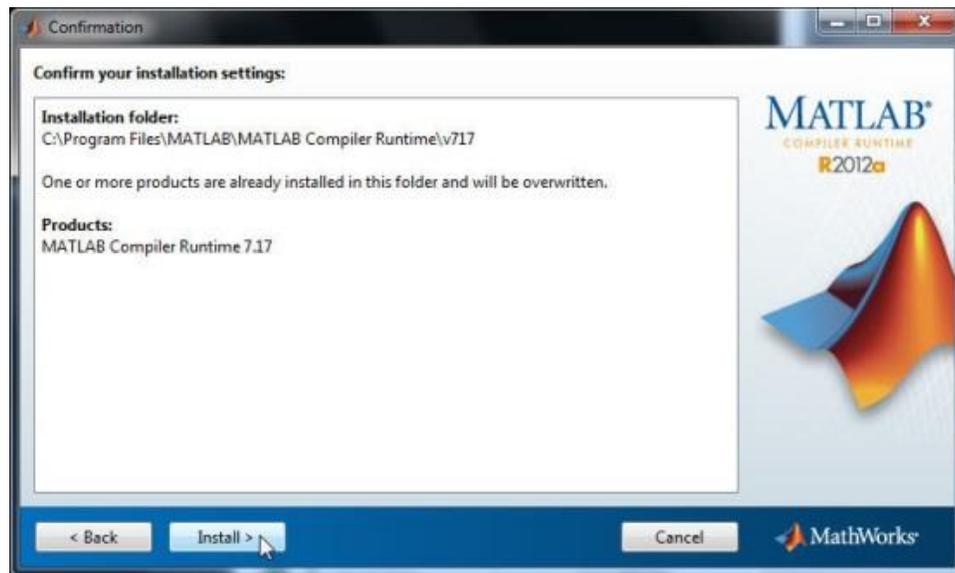
5. When the self-extraction of the compiler runtime installer is complete, the installer will run automatically. Please allow it to run and follow the instructions, as depicted in Figure 5, for installation of the MATLAB Compiler Runtime R2012a. (Note that all of the MATLAB components needed in this step come bundled with the 'nirslab\_v201412\_pkg.exe' file. Thus it is not necessary to have any MATLAB versions already installed with the computer you are using. Please be assured, however, that no files will be overwritten, deleted or corrupted if you do have MATLAB already installed.)



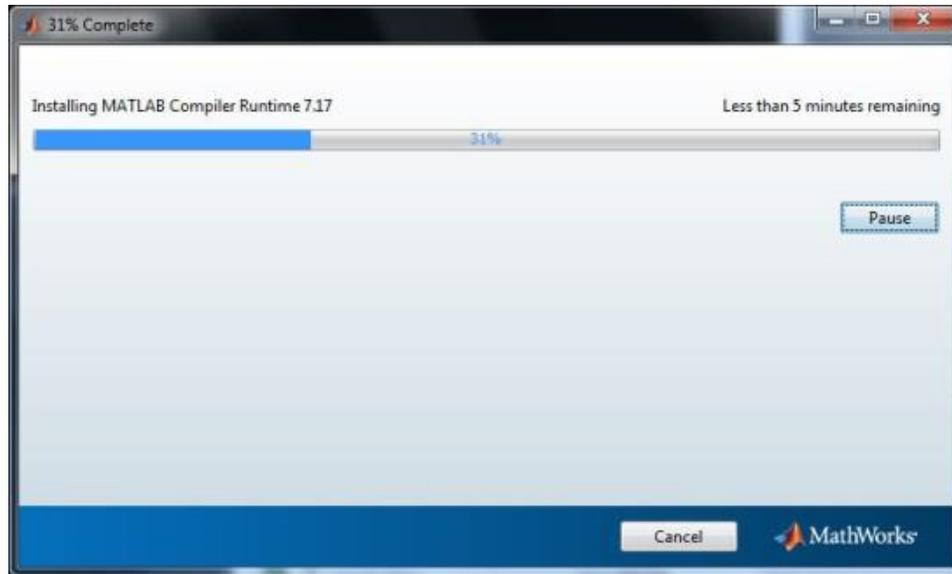
**Figure 5.** (a) First MATLAB pop-up window to appear during the installation of the compiler runtime component. Click on the 'Next >' button at the bottom.



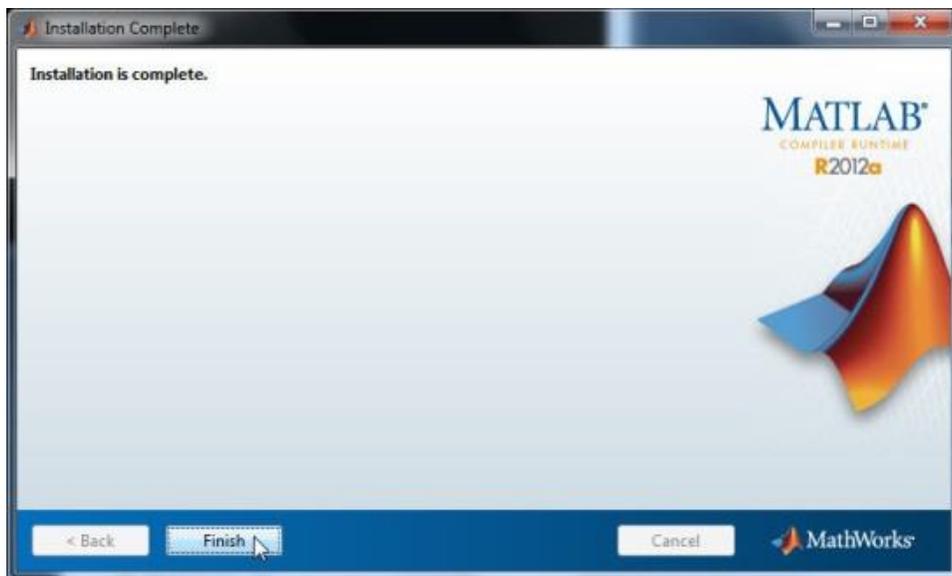
**Figure 5. (b)** Second MATLAB pop-up window to appear during the installation of the compiler runtime component. Select 'Yes' to accept the terms of the license agreement, then click on the 'Next >' button at the bottom.



**Figure 5. (c)** Third MATLAB pop-up window to appear during the installation of the compiler runtime component. To proceed, click on the 'Install >' button at the bottom.

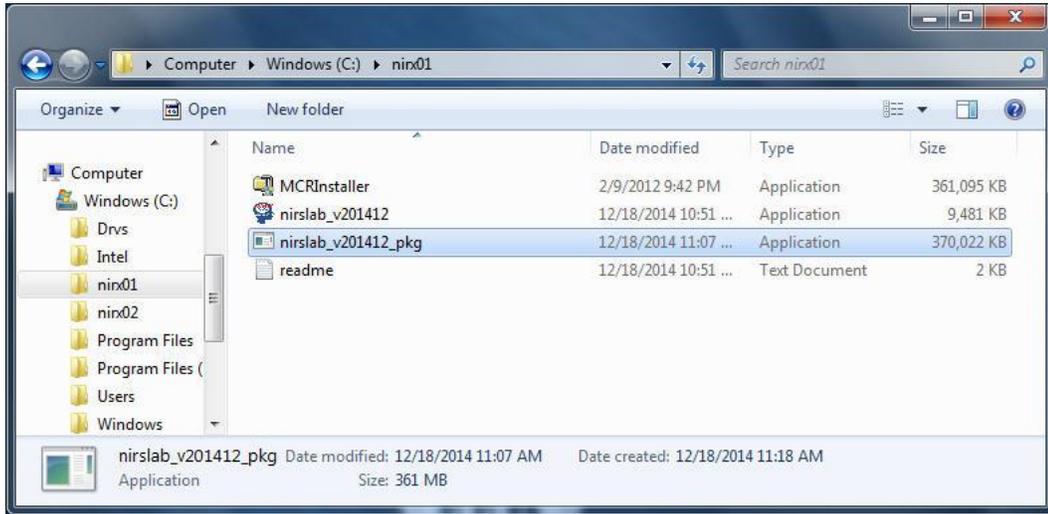


**Figure 5. (d)** Fourth MATLAB pop-up window to appear during the installation of the compiler runtime component. It contains a progress bar that shows how close the installation is to completion. When installation is complete, this window is automatically replaced.



**Figure 5. (e)** Final MATLAB pop-up window to appear during the installation of the compiler runtime component. Click on the 'Finish' button at the bottom to exit from the installer.

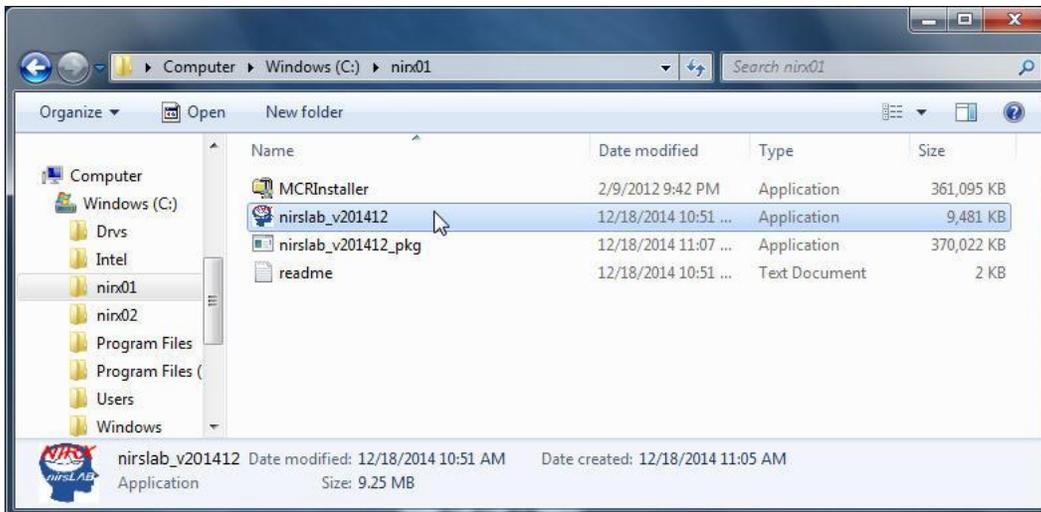
- When the installation is complete, you will find that there are three more files in the folder where the installation file is stored, as shown in Figure 6. The file named 'nirslab\_v201412.exe' is the executable nirsLAB file that you have just installed.



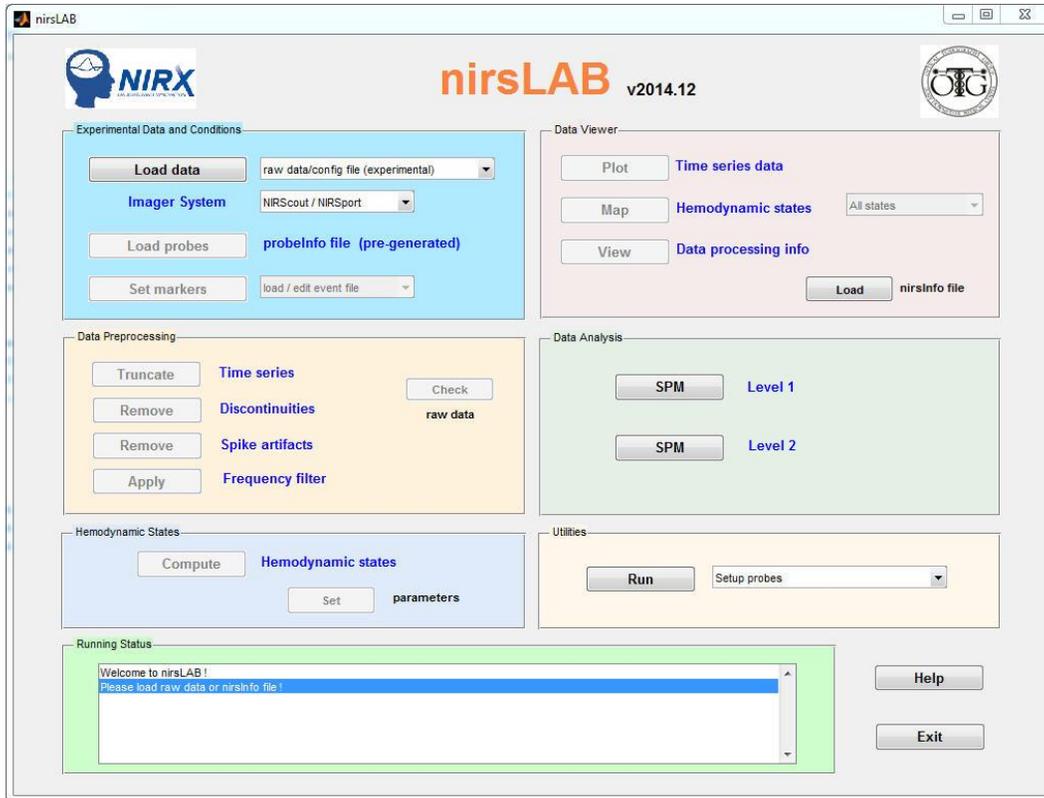
**Figure 6.** Files present in the folder containing the 'nirslab\_v201412\_pkg.exe' file, after installation of 'nirslab\_v201412.exe' is complete.

## How to run the executable version of nirsLAB

In Windows Explorer, navigate to the folder where the 'nirslab\_v201412.exe' file is stored, and double-click on the file, as shown in Figure 7. The nirsLAB GUI will open, as shown in Figure 8. Do not be alarmed if there is a delay of several seconds between your action (*i.e.*, clicking on the file name) and the response (*i.e.*, the GUI opening); do not click a second time or take any other action.



**Figure 7.** Launching the executable nirsLAB version, by clicking on the file name in Windows Explorer.



**Figure 8.** The home screen for the executable nirsLAB version, which opened after the program was launched as shown in Figure 7.

For a more convenient launching of nirsLAB, you may copy the executable nirsLAB file (nirslab\_v201412.exe) to your Desktop, or else create a nirsLAB shortcut on the Desktop (a practical advantage of the latter option is that a shortcut is a 1-kb file, while the executable file size is over 9 Mb). To make a Desktop shortcut: 1) click the secondary mouse button (*i.e.*, “right-click”) on ‘nirslab\_v201412.exe’ in Windows Explorer, which will open a pop-up menu; 2) click the primary (left) mouse button on the ‘Send to ►’ menu item (and *not* on ‘Create shortcut’), which will open a second pop-up menu; 3) click the primary mouse button on the ‘Desktop (create shortcut)’ item in the second pop-up menu. Figure 9 shows an example of a Desktop shortcut for the executable nirsLAB. In the example shown, we also have changed the name of the shortcut, from the default ‘nirslab\_v201412.exe - Shortcut’, to ‘nirslab v201412’.

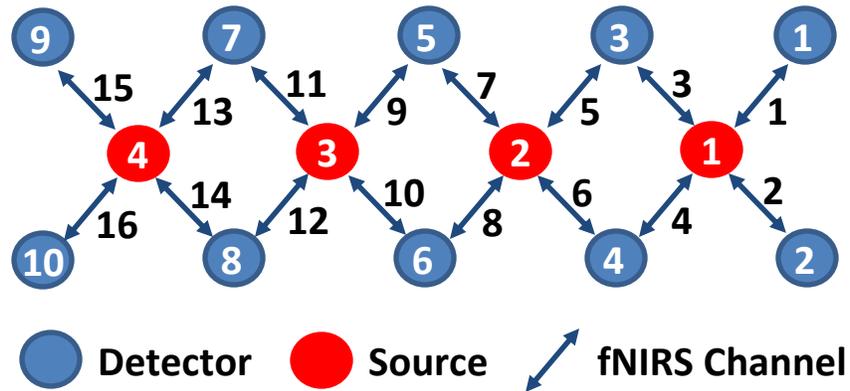


**Figure 9.** An example of a Desktop shortcut for launching the executable version of nirsLAB.

Launch the executable nirsLAB by double-clicking on the shortcut or copied file on your Desktop.

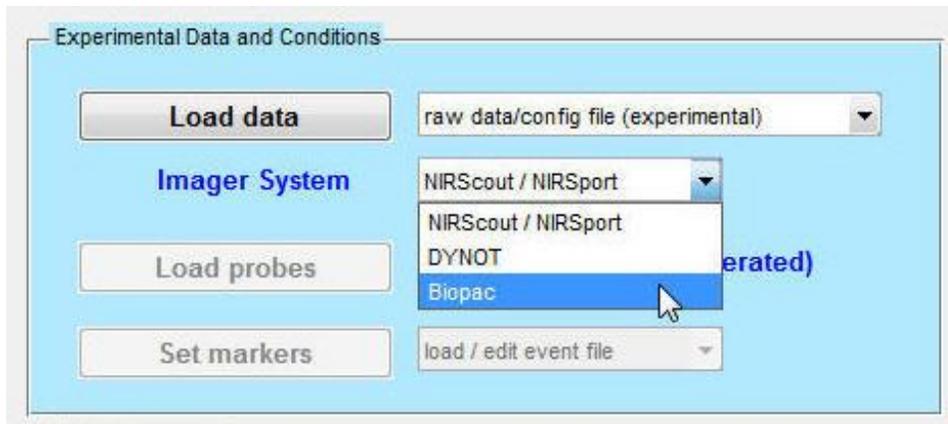
## Loading and analyzing Biopac raw data with nirsLAB

1. Use the Probe Setup tool of nirsLAB, according to your experimental source-detector arrangement, to create a probeInfo file (see Chap. 7 of nirsLAB user's manual). Note that for Biopac fNIRS imager systems the source-detector layout is fixed, as shown in Figure 10. There are 4 sources, 10 detectors and 16 selected nirs channels.



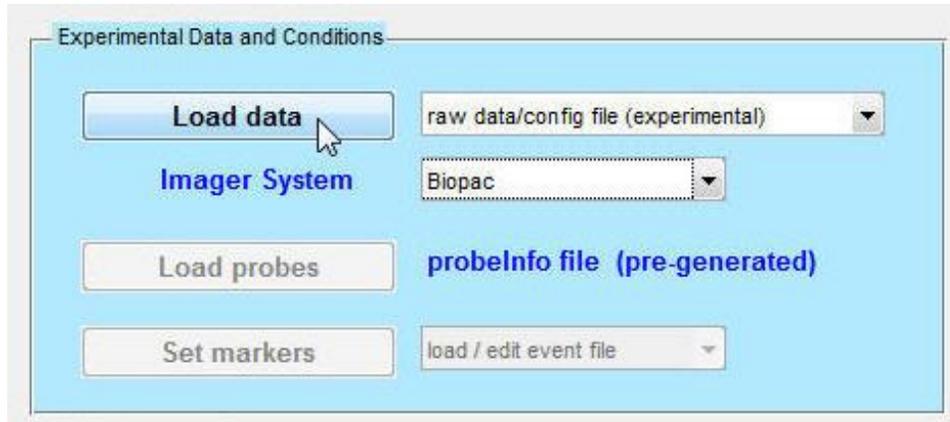
**Figure 10.** The (fixed) probe layout associated with Biopac fNIRS data acquisition systems.

2. Click on the **Imager System** pull-down menu in the 'Experimental Data and Conditions' portal, and select the 'Biopac' imager type, as illustrated in Figure 11.

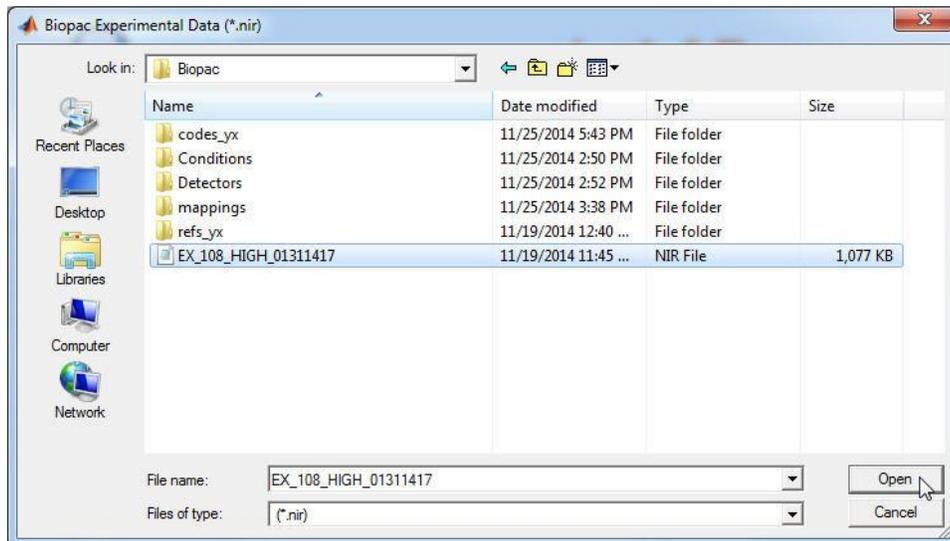


**Figure 11.** Selection of the 'Biopac' item from the **Imager System** pull-down menu in the nirsLAB GUI.

3. Click on the **Load data** button, as indicated in Figure 12. This action will open a browser window, as seen in Figure 13, which is used to navigate to a folder containing raw data (\*.nir and \*.mrk) files produced by a Biopac system. As shown in Fig. 13, select a file whose name ends with '.nir', and click on the 'Open' button to load it.

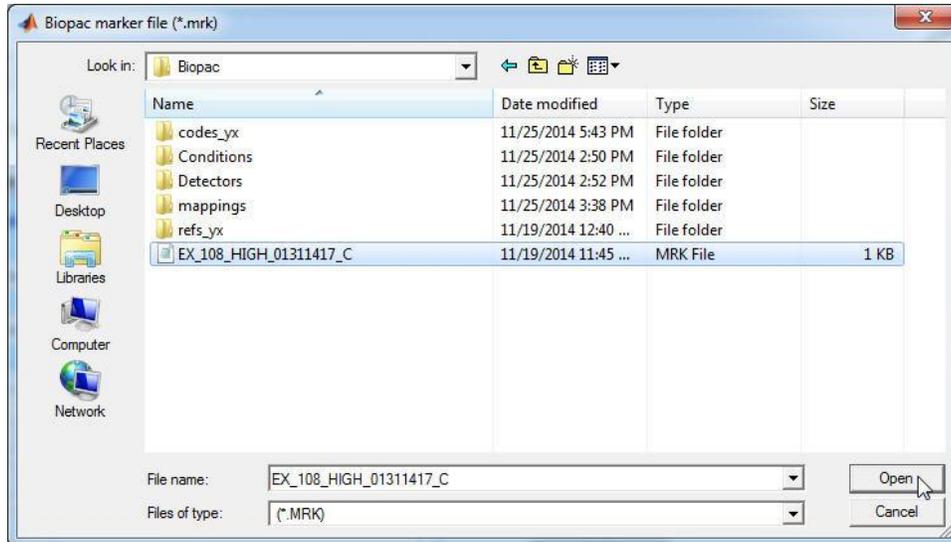


**Figure 12.** After selecting the ‘Biopac’ item from the **Imager System** menu, click on the **Load data** button.



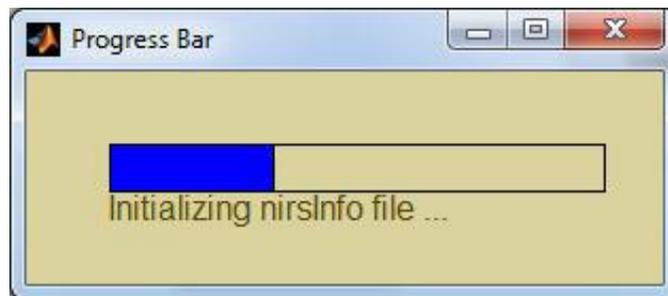
**Figure 13.** The browser window that pops open when the **Load data** button is clicked. Navigate to a folder containing \*.nir output files from a Biopac system, and select one.

The browser window depicted in Figure 13 will automatically close, and a second browser window, as shown in Figure 14, will automatically open. Select a file whose name ends with ‘.mrk’ (these are the Biopac event-marker files), and click on the ‘Open’ button to load it.



**Figure 14.** The browser window that pops open when the ‘Open’ button seen in Fig. 13 is clicked. Navigate to a folder containing \*.mrk output files from a Biopac system, and select one

When the loading of the raw data files is complete, nirsLAB will automatically initiate the project (*i.e.*, create a nirsInfo file, as explained in Chap. 2 of the nirsLAB user’s manual). During the initiation process, a progress-bar window will open (see Figure 15), and it will automatically close when the process is complete.



**Figure 15.** The progress bar that accompanies generation of a \*\_nirsInfo.mat file after the \*.nir (see Fig. 13) and \*.mrk (see Fig. 14) files are loaded.

4. Follow the instructions contained in the nirsLAB user’s manual to load a \*\_probeInfo.mat file, edit an event file, etc.