I. Content

Revision: 1	Approved
on: November 17th, 2015	on:
by: Ulrich Szagun	by:

II.   Cs5normpos: Head correction with pre-transformation matrix

- ➢ Open the program cs5normpos and choose a session-folder (Figure II-1 and Figure II-2).
- ➢ If no reference object file exists choose a sweep and click *Create* (Figure II-1).
- ➢ Activate the *Use 4x4 pre-transformation matrix* checkbox (Figure II-4-1) and
    - o either create a pre-transformation matrix (Figure II-4-2)
      Refer to Chapter III for creating a rotation matrix with cs5rotate.
    - o or choose an existing matrix from the file system (Figure II-4-3)
- ➢ Select the head correction sensors (reference sensors and start the position calculation (Figure II-5).
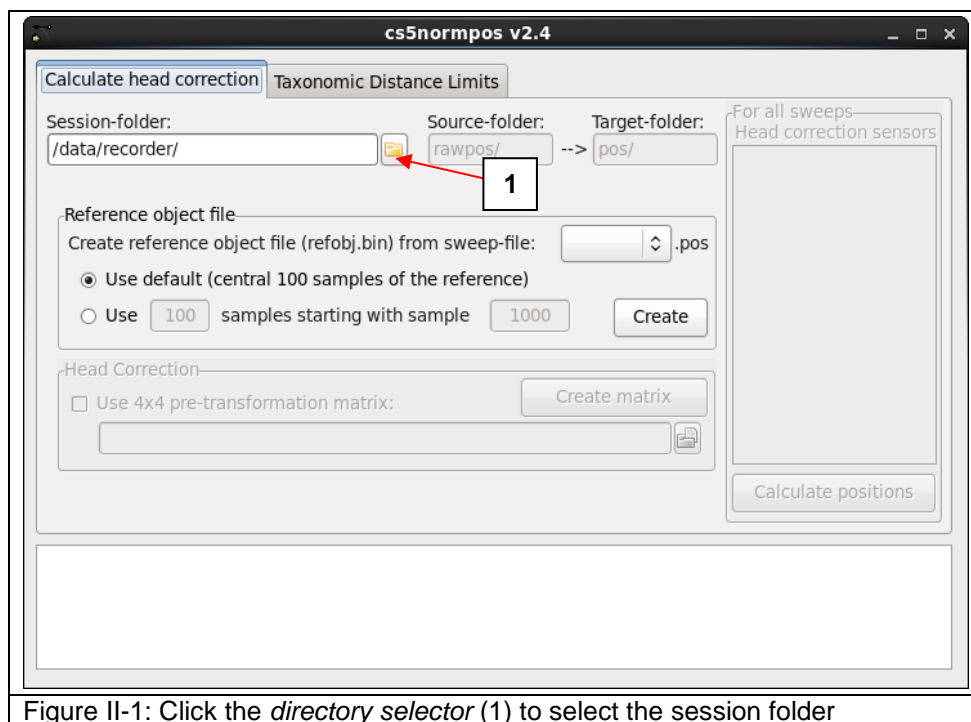

Figure II-1: Click the *directory selector* (1) to select the session folder
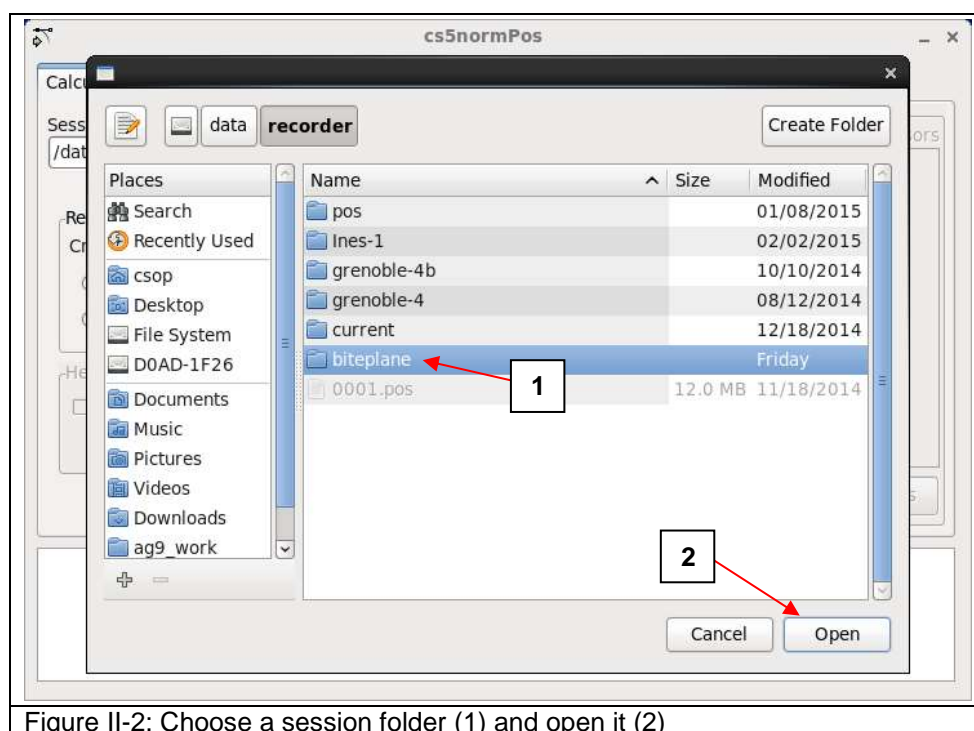
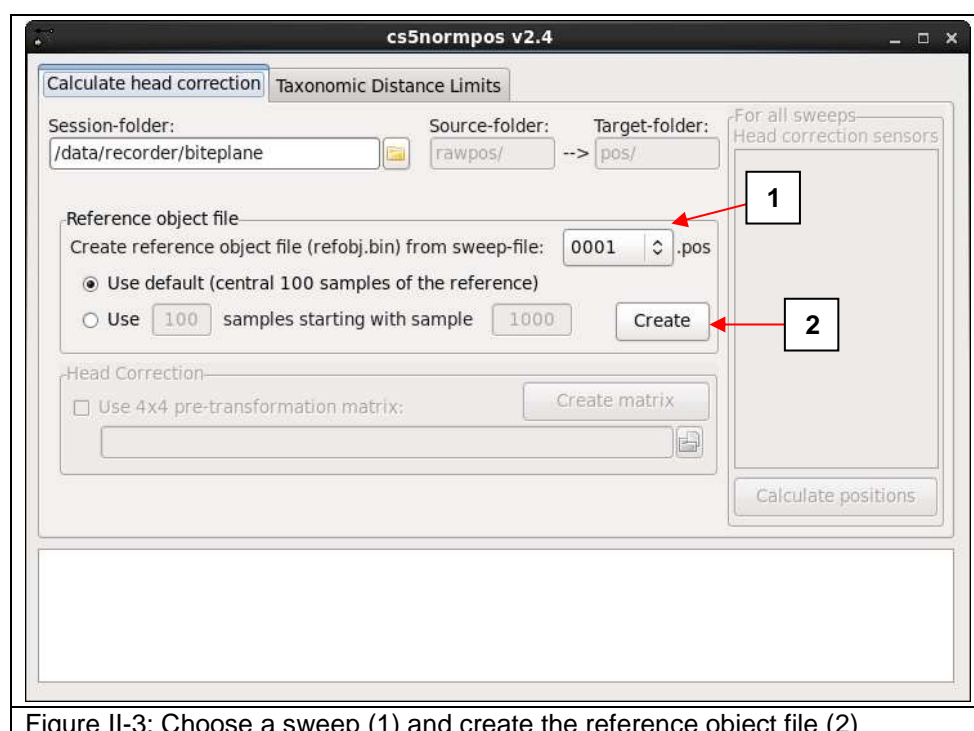Figure II-2: Choose a session folder (1) and open it (2)

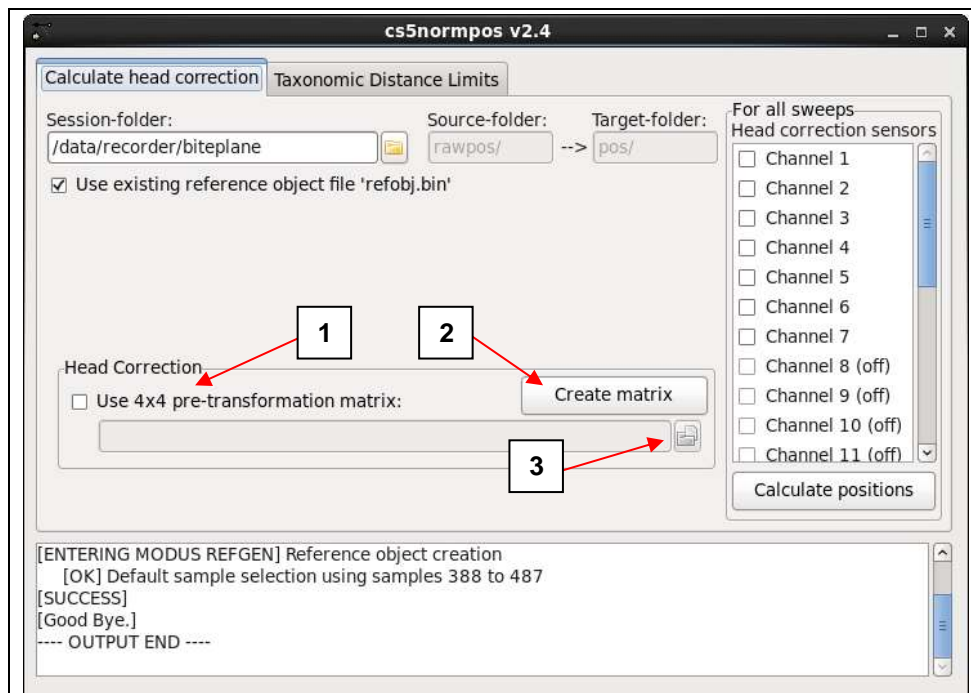Figure II-3: Choose a sweep (1) and create the reference object file (2)

Figure II-4: Activate *Use 4x4 pre-transformation matrix* (1) and
   either create a pre-transformation matrix (2)
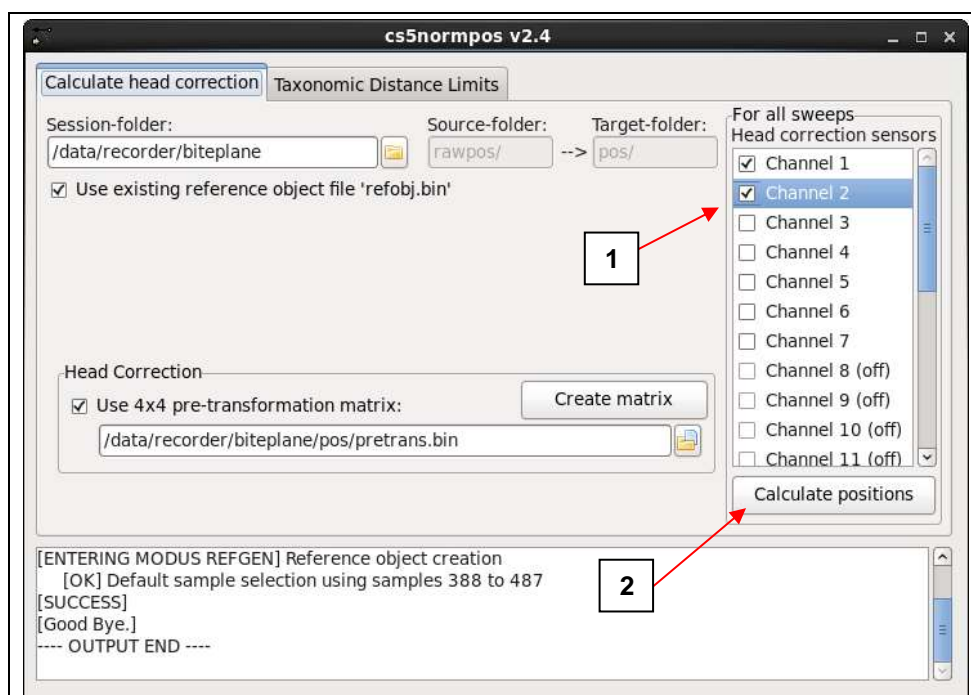   or choose an existing matrix from the file system (3).

Figure II-5: Select the reference sensors (1) for head correction and
start the position calculation (2)

III.   Cs5rotate: Create a pre-transformation matrix

Open the program cs5rotate.

If the program is opened from cs5normpos (Figure II-4-2) the reference object file of the cs5normpos session-folder is already loaded and all active channels imported. If you do not want all channels imported you may repeat the channel selection (Figure III-3).

Otherwise you can continue with Chapter III-B.

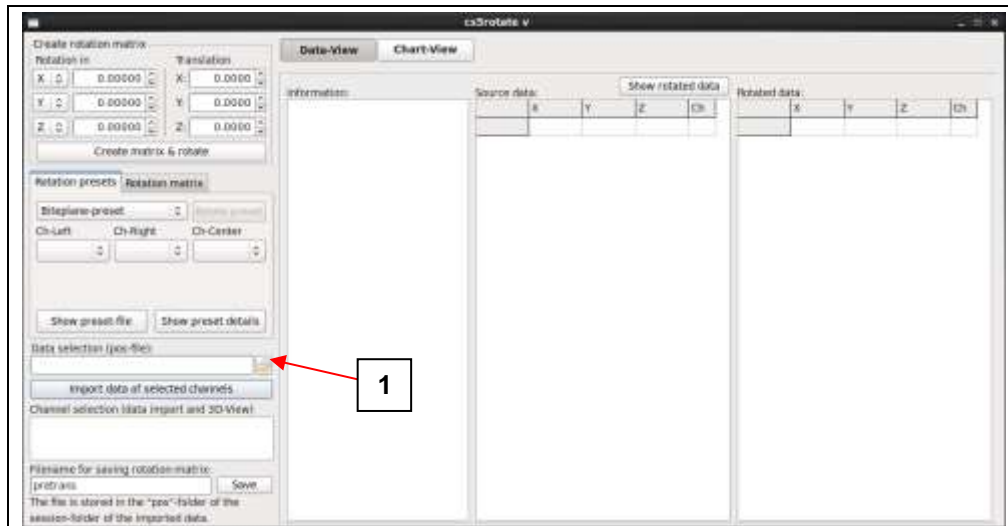### A. Choose reference object and channels for rotation

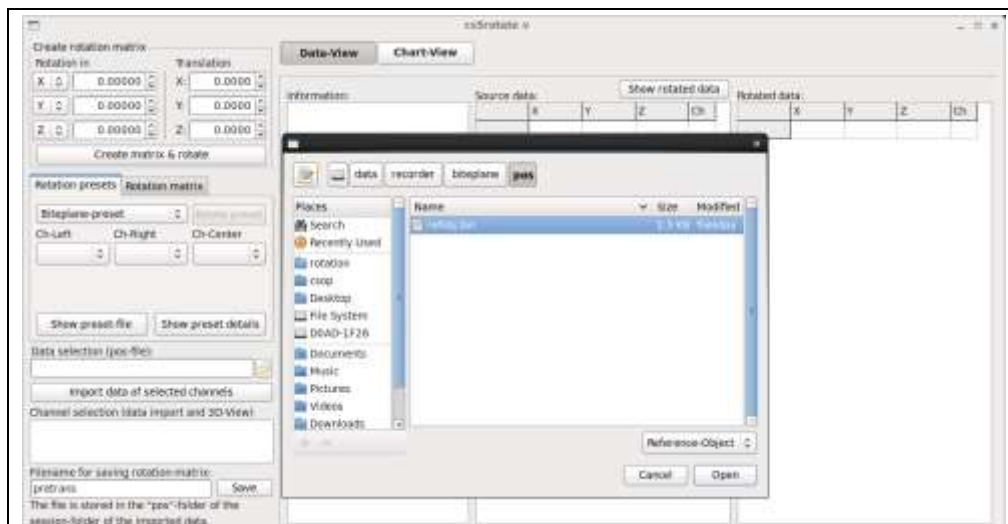Figure III-1: Click the *file selector* (1) to select the reference object file (refobj.bin).

Figure III-2: The ref-object file is usually located in the pos-folder of your session. Select the reference object file and open it.
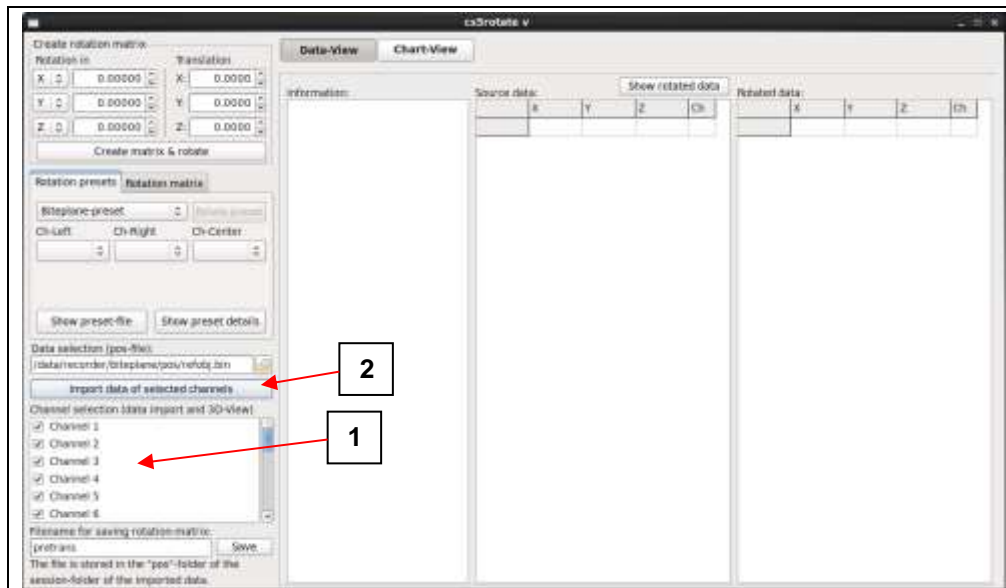
Figure III-3: Select the channels you need for rotation (1). For the creation of the matrix you only need the channels of interest, for instance the channels that define the bite plane or channels you need to define the midsagittal plane.

By default all channels of the reference object are selected.

Click *Import data of selected channels* (2).

B. Rotation of data and saving pre-transformation matrix

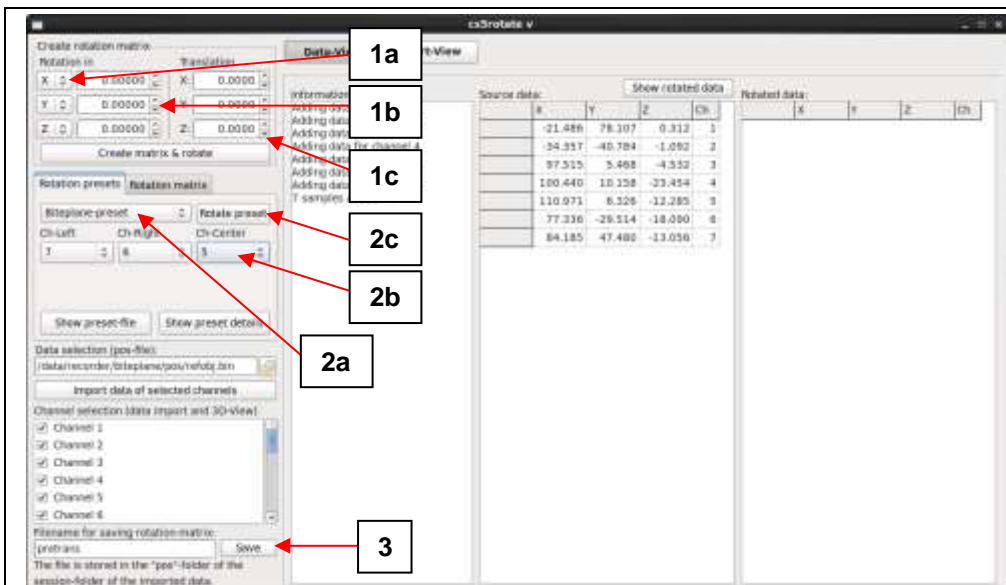

Figure III-4: Currently there are two options for data manipulation:

(1)   Rotate data manually by choosing the rotation axis (1a), the rotation angles (1b) and the translation (1c) along the axes.
The rotation sequence is of importance – you get different results, if you rotate data by the same angles but in a different order.

(2)   Choose a rotation preset (2a) and (depending on the preset) the required sensors (2b) and start the rotation (2c).

Click *Save* (3) to export the pre-transformation matrix. It is saved in the pos-folder of the session-folder.
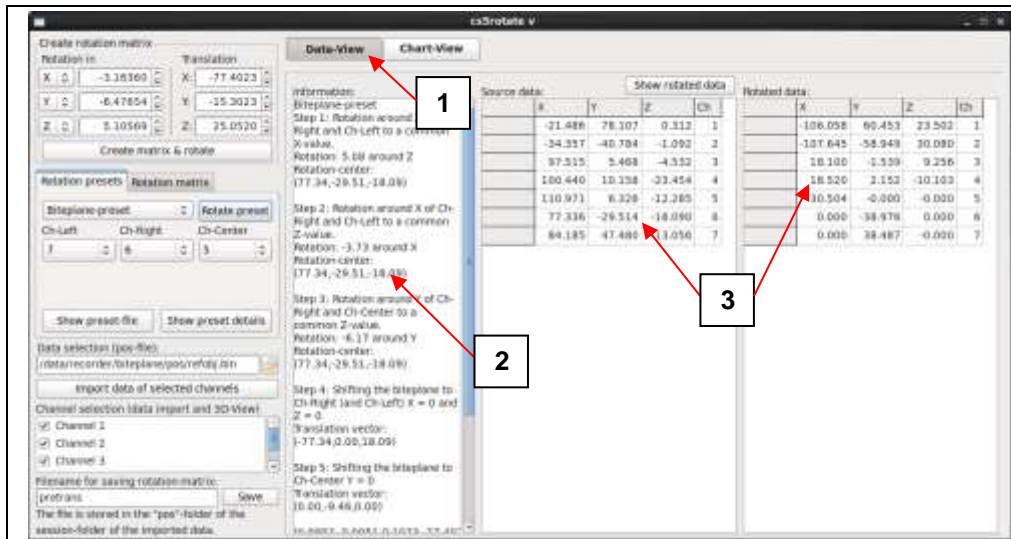
C. Monitoring options

1. Data-View

Figure III-5: The *Data-View* (1) displays import or rotation *information* (2) as well as the imported *source data* and the *rotated data* (3).
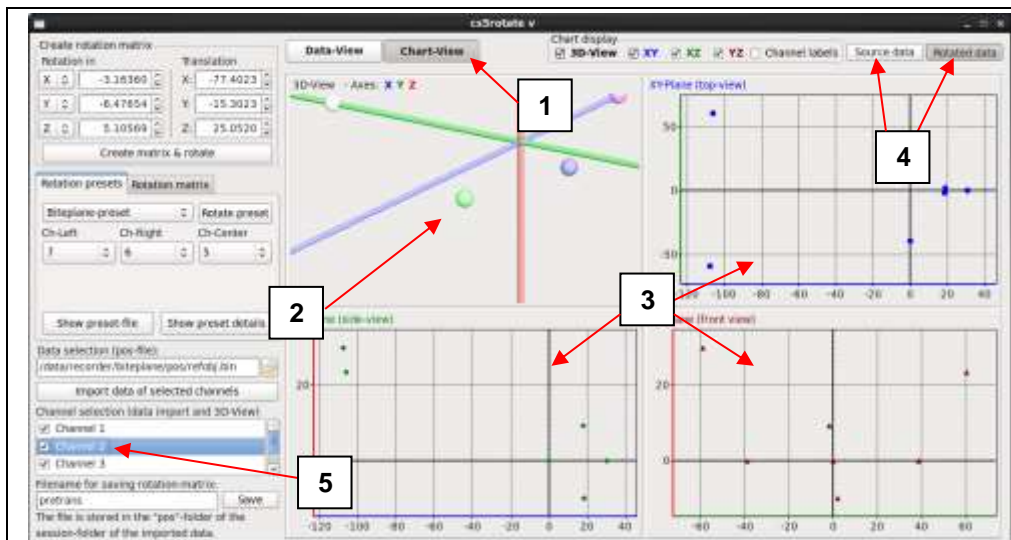
2. Chart-View

Figure III-6: The *Chart-View* (1) contains the 3D-View (2) as well as the projections to the XY- (top view), XZ- (side view) and YZ-Plane (front view) (3).
Select with the *data buttons* (4) whether to display the source or rotated data.
A double click on a channel (5) centers the selected channel in the 3D-View (2).
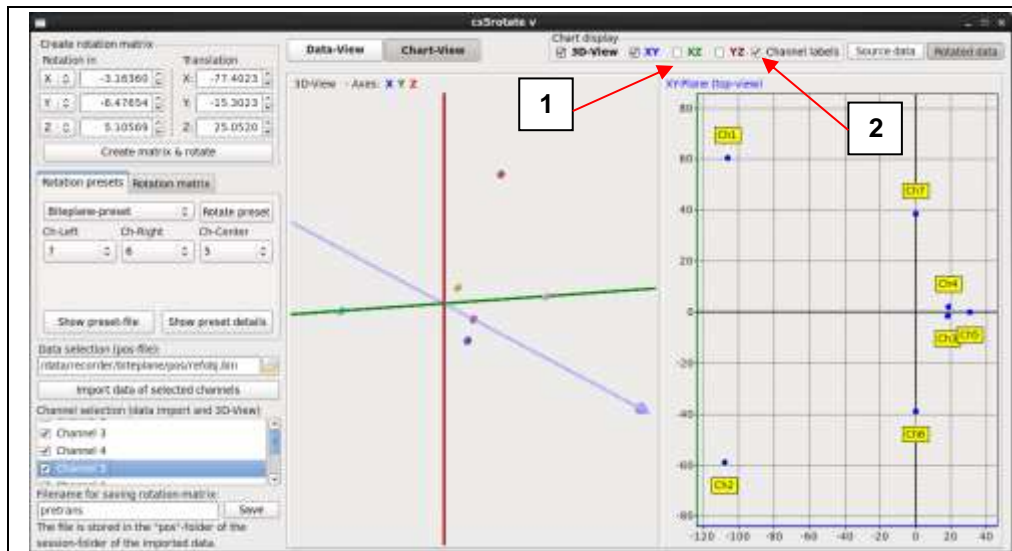
Figure III-7: The *Chart display* (1) determines which views are visible.
In this example the *XY-Plane* (top-view) and the *3D-View* are displayed.
The *Channel labels*-checkbox (2) toggles the visibility of labels for the easy
identification of the sensors in the 2D-views.

D. Rotation Presets

Rotation presets can automate recurring rotation tasks and make the creation of a rotation matrix reproducable for specific conditions.

The *Biteplane-preset* is configured for the Carstens Biteplane-device.

Besides the predefined rotation-preset of Carstens Medizinelektronik users can define their own rotation presets for recurring tasks.

User presets are stored in JSON-format in the rotationpresets-folder in the {home}-directory

(for example /home/csop/rotationpresets/mypresets.json).

A JSON-overview can be found at http://json.org/.

A description of the file-structure and parameters of a rotation-preset can be found in the AG-Wiki: http://wiki.ag500.net/Rotation-Presets

IV.   Revision history - Head Correction - HowTos

Date	Revision	Annotation
November 17th, 2015	1	Initial documentation (Ulrich Szagun)