ECG Triggering & Respiration Gating

ECG triggering and respiration gating are used to suppress imaging artifacts due to cardiac movements and respiration. Both are important in cardiac and abdominal imaging for both 2D and 3D data sets.

Respiration Gating

The respiration gating is controlled using the respiration signal acquired by the system from the mouse platform. The gating can be turned on/off from the physiology panel.

The image below displays the optimum interval for acquisition using the respiration gating, since body movement is minimal during this period.

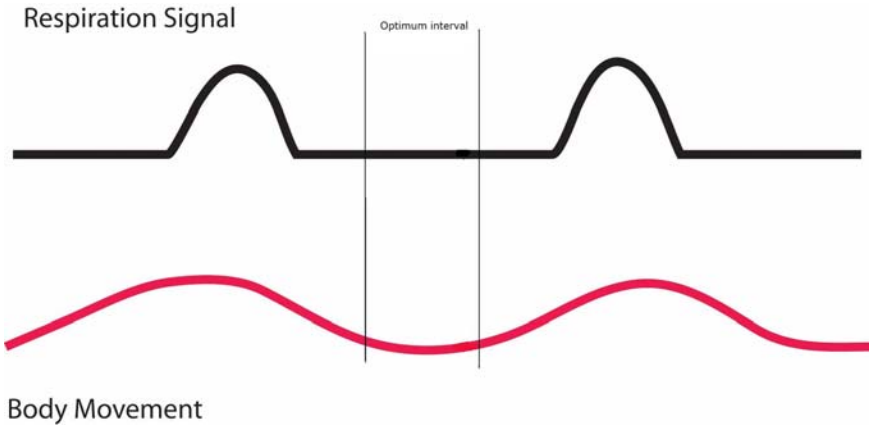

Figure 1 – Display of the respiration pattern vs. the body movements

As displayed in Figure 1, the respiration signal can display a long enough interval in between two respiration peaks, however in reality, the body also moves at a certain delay and so the non-movement interval is actually much shorter.

ECG Triggering

The ECG triggering is controlled using the ECG signal acquired by the system from the mouse platform. The triggering can be turned on/off from the physiology panel using two purple markers.

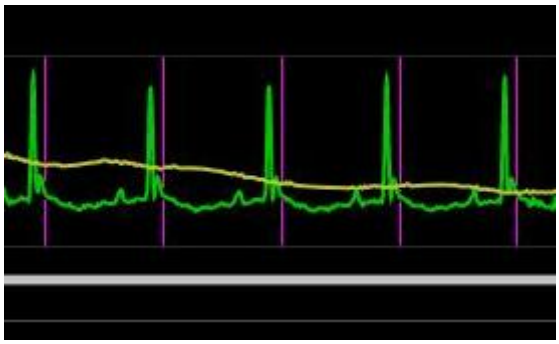

Figure 2 – Display of ECG signal with trigger markers (in purple)

The markers can be set anywhere in the cardiac cycle. Therefore the images can be triggered to either systole or diastole. It is possible to capture a 2D image of the heart in full systole and/or diastole. The user can then quantify cardiac function from a 2D image. This will be more accurate as opposed to acquiring this quantification from the M-Mode (which is only one line as opposed to a whole slice with the 2D image).

Furthermore, ECG triggering minimizes artifacts not only in cardiovascular applications but all types of imaging. Often, the respiration gating may not be enough to remove movement artifacts for anatomy close to the chest. Setting up the ECG trigger along with the respiration gating will minimize the artifacts due to the heart movements as well.