Workshop: ECGSIM

Date: April 12th; 2014;

Venue: Hotel De Witte Raaf, Noordwijk

Occasion: MALT 2014

Duration: 2 hours

Presenter: A. van Oosterom

Objective:

Training in the use of the ECGSIM software and its application in the study of the relationship between the electrical activity of the heart and the signals and fields (images) that this generates on the heart surface (electrograms) and on the thorax (the ECG).

Background:

The ECG signals are determined by the time course of the electric currents generated by the local differences (divergence) of the local gradients of the cardiac myocytes. These currents generate potential differences between any two electrode locations sensing the ECG.

Next to these time courses, the waveforms observed in ECG signals depend on the locations of these sensors relative to those of the source elements.

The Tool:

In the ECGSIM software, a set of (1500) equivalent current sources are implemented, located on the closed surface bounding the active myocardium (ventricles or atria). For each of these the time course describing the source strength is modelled according a template representing the time course of the transmembrane potential (TMP) of nearby myocytes. The timing of local depolarization and repolarization, as well as the magnitude of the upstroke of the TMPs may set interactively. A default setting of these parameters is included, which creates a reference set for creating a normal ECG.

A set of suggestions for applying meaningful changes in the default parameter setting will be handed out during the workshop. These include the application of the local or global parameter changes, as well as of the tools included for studying the effect of the source to observation point differences.

The study of the Manual (www.ecgsim.org) prior to the workshop will add to its effectiveness !!!