# SENSITIVITY MAP GENERATION SOFTWARE MAKEMAP

OVERVIEW

The PTL **Makemap** software calculates **accurate sensitivity maps for circular ECT sensors** with either **internal** or **external** electrodes. The calculation is based on the use of an exact **analytical model** of the **capacitance sensor**. Sensitivity maps for a number of **measurement protocols** can be calculated, including the conventional arrangement where one electrode is excited as a source electrode and the remaining electrodes are held at virtual ground potential and act as detector electrodes.
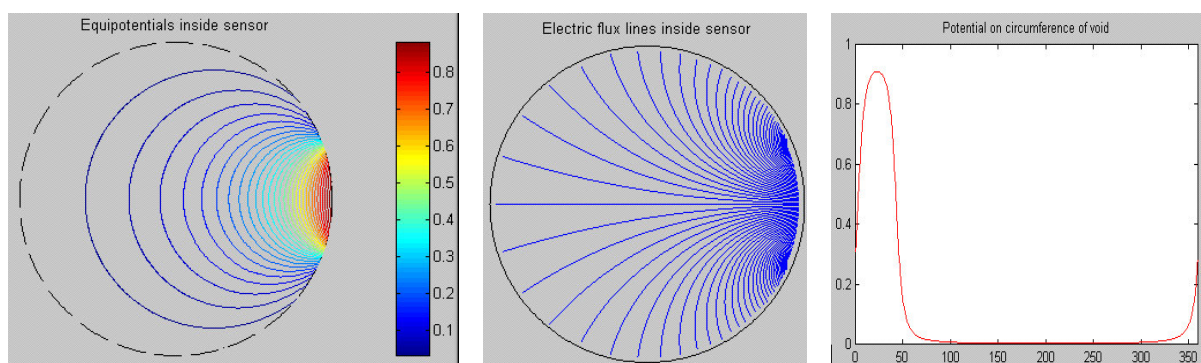
Intermediate windows displayed during map generation

The program displays a number of **intermediate windows** during the calculation to indicate progress. The **electric potential distribution** inside the sensor is first plotted, followed by the equivalent **electric field distribution** and the **electric potential** around the **inside wall** of the sensor, as shown above. The individual **sub-maps** are then calculated and the **primary sub-maps** are displayed at the end of the program in the format shown below.
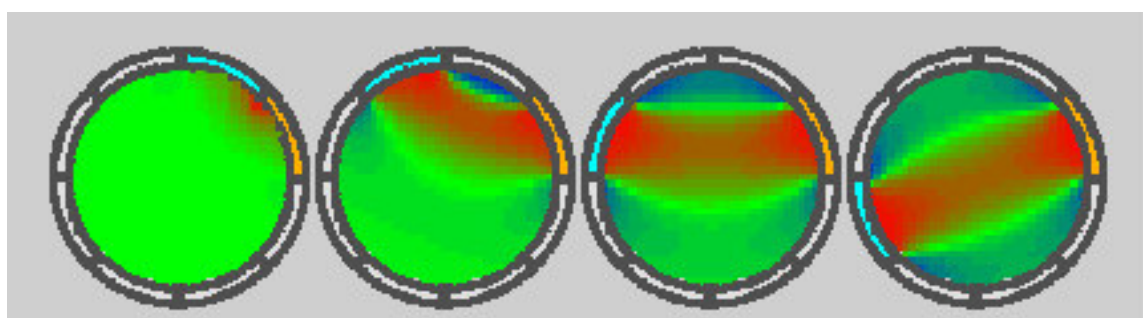

Primary sensitivity maps for an 8-electrode ECT sensor

The calculated sensitivity maps can be used directly with either the standard **PTLECT** or **ECT32** software. Alternatively, they can be viewed in detail and modified using the set of **Matlab mfiles** contained in the **PTL Matect** software suite, provided that the user has a copy of Matlab 5.3 or later available.

Program Details and outline specification

When the **Makemap** program is run, the **user interface window** shown below appears to allow the details of the **sensor geometry** to be entered by the user.
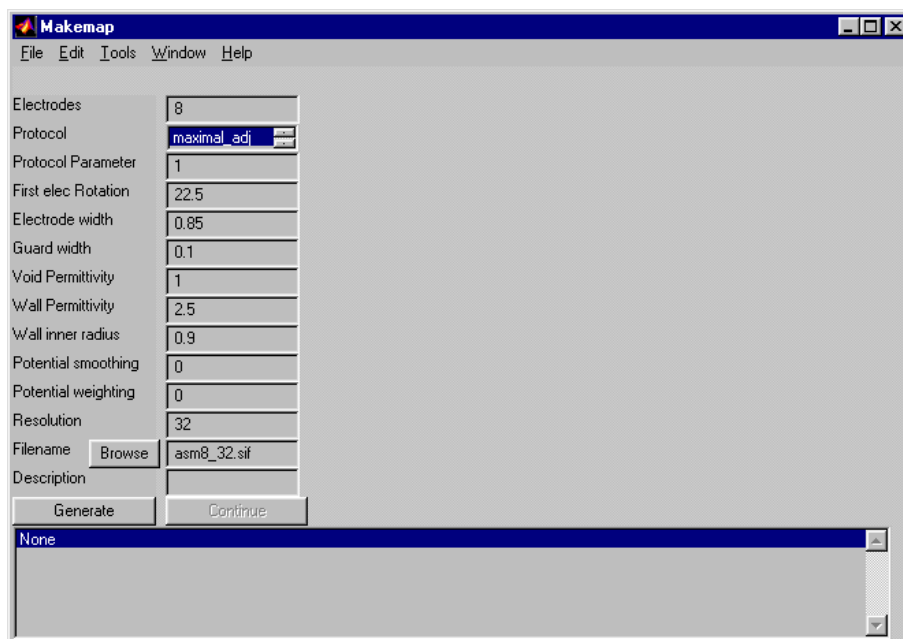
Makemap opening user interface window

The sensor geometry is defined in terms of the number of electrodes, electrode width, axial guard width and insulation gap width (where width means the fractional arc length). The inner and outer tube wall radius can also be defined for sensors with electrodes located outside a dielectric tube, together with the permittivity of the tube contents. The user must also define the measurement protocol and the format of the required maps (ECT32 or PCECT). Once these parameters have been entered correctly, the program runs and displays the windows shown on the preceding page before generating the sensitivity map files.

The **Makemap** software is supplied as compiled code which can be run on any PC. However, because of the intensive computional requirements, a PC with a 500MHz processor and at least 128MB of RAM is recommended, as this minimises the computation time required to generate each map. A 12-electrode map can be generated in approximately 5 minutes by running **Makemap** on an optimised PC.

For further information, please contact us at the address below, or visit our internet web site at : **www.tomography.com** which contains sales and application data.

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