Chapter 30

Multiband Evaluation

30.1 Introduction

Wireless devices exist that can transmit at multiple frequencies at the same time. An example of this is a cellular telephone and PDA combination that can simultaneously transmit a cellular telephone signal (e.g., at 900 MHz) and a wireless LAN signal (e.g., at 2450 MHz). It is possible that such a device may be compliant with the regulatory SAR limit at each frequency while the composite SAR from simultaneous transmission is above the limit. Therefore, the accurate determination of the SAR in this situation is important. Given that the tissue simulating liquid and the probe calibration are frequency dependent, and given that existing SAR measurement systems are unable to separate the frequency components of a signal, it is not possible to accurately measure the SAR from such a transmitter using one measurement in one liquid.

DASY4 therefore provides the possibility to perform such Multiband Evaluations according to the latest standards, e.g., [1] using the Volume Scan job as well as appropriate routines for the Postprocessing.

30.2 Multiband Measurements

The Volume Scan job described in Section 7.2.11 Volume Scan job allows to conduct the measurement of volumes with sufficient spatial extend such as outlined in the procedure proposed in [1].

The resulting measurement jobs can be finally evaluated and combined within the SEMCAD Postprocessor.

30.3 Multiband Data Extractions

In order to extract and process measurements within different frequency bands, the SEMCAD Postprocessor allows to combine and subsequently superpose these measurement data in the Chart Manager.

The appropriate process is outlined as follows:

1. Via drag-and-drop, the quantities to be combined can be added to the Chart Manager.

> **Note:** Since different media were used at measuring the various bands, the results from the different Programs need to be added to one single Chart Manager. Therefore, the user can open two (or more) instances of SEMCAD, and drag-drop a specific result from one SEMCAD instance to the Chart Manager of another one.

> **Note:** The measurement grids of the jobs which should be combined in the Postprocessor should be the same, i.e., should contain the same number of points located approximately at the same locations.

2. Via multiple selection within the Chart Manager list, the appropriate items to be combined can be chosen. By use of the Shift or Ctrl keys on the keyboard in addition to mouse clicking in oder an appropriate set of items is selected.
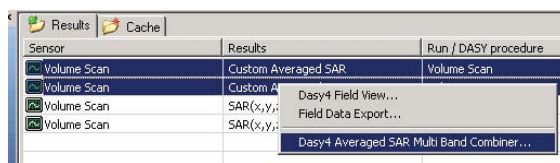
Application of the Multiband extraction to a set of items in the Chart Manager.

> **Note:** In order to evaluate and combine Averaged SAR, the Custom Averaged SAR result field should be selected.

3. In a next step, the kind of viewer to be used for the visualization or the data export, can be selected.
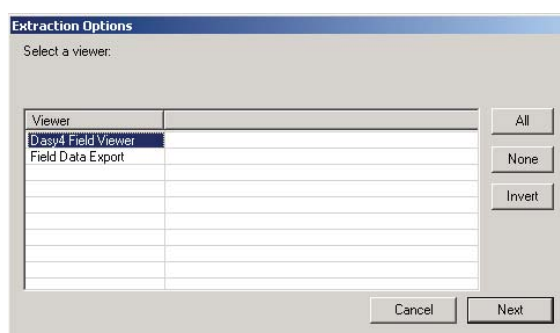
Selection of a viewer type in the Extraction Options dialogue.

4. In a final step, the results are displayed graphically and by numbers in the selected viewer or are exported as defined by the user.
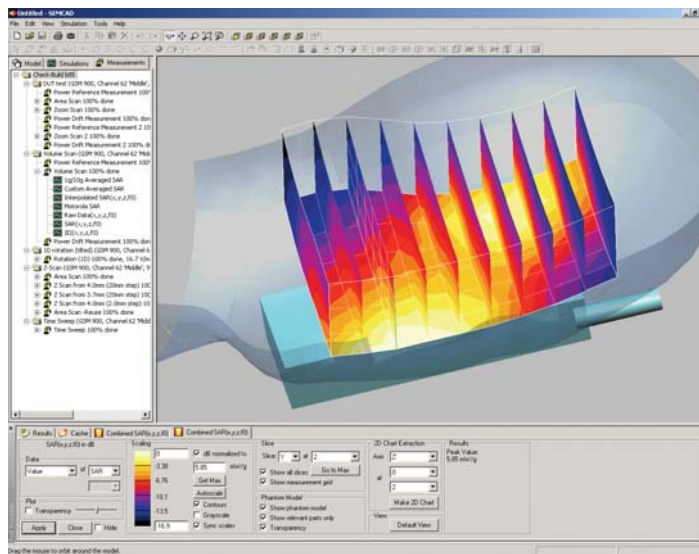
Display of results (3D Volume Scan) from the superposition of measured data in the viewer.

Note: For the Volume Scan job, in addition to the common quantities, SEMCAD allows the extraction of the Total Absorbed Power in the medium. This will be extracted for the Averaged and Interpolated SAR result fields.

Note: In order to perform a printout of the combined measurement data, please use the MulitbandPrintout.htm print template provided in the appropriate folder on the DASY4 CD.