



THE REVOLUTION CONTINUES

SOURCE 5™

*Remarkably Simple, Accurate and Fast Reconstruction.
No Compromises - Infinite Possibilities.*



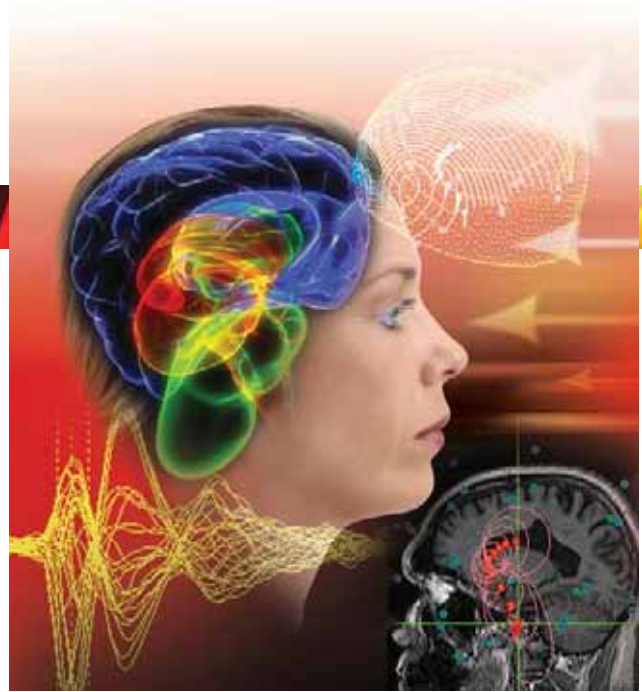
SOURCE 5™

Features of SOURCE 5

SOURCE 5 integrates functional (EEG or MEG) and anatomical imaging modalities (MRI, fMRI, or CT) in a single software package. By combining reconstructed electrical activity in the brain with anatomical or functional images, **SOURCE 5** provides a powerful method for localizing the sources of such activity.

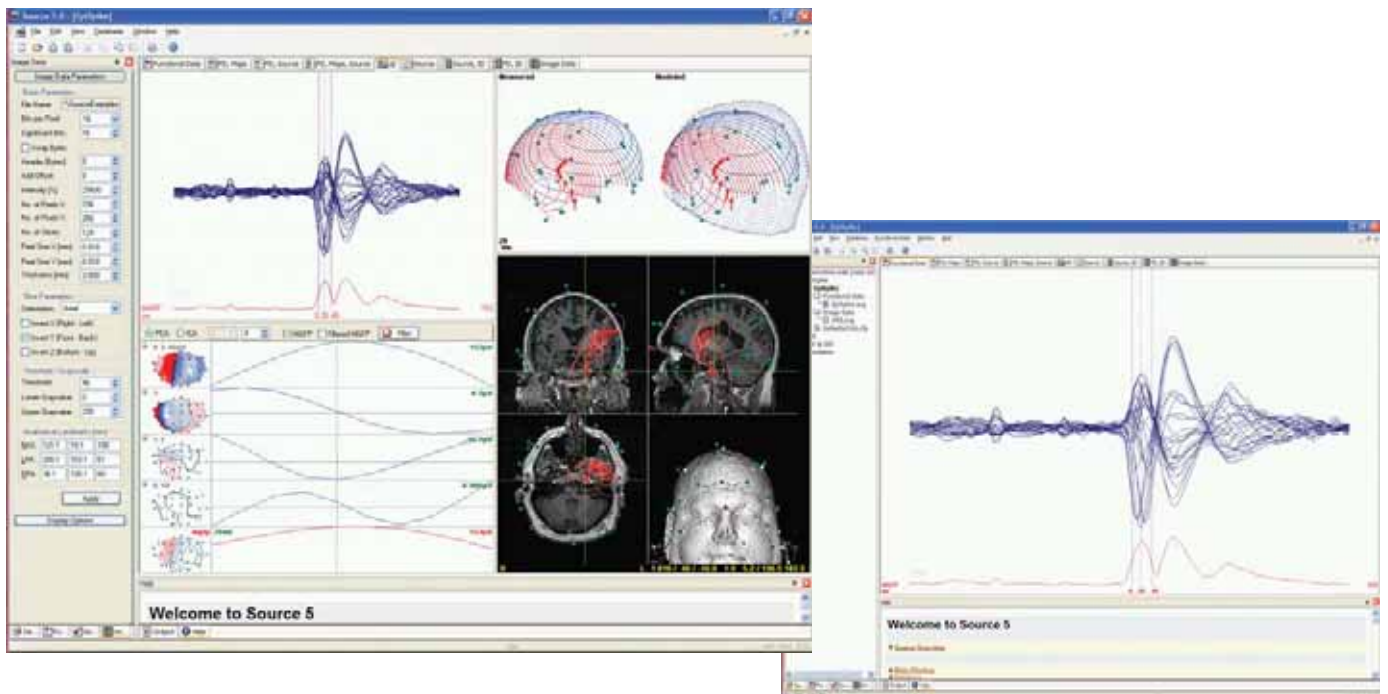
SOURCE 5 uses the physical anatomy from MR and CT to provide an overlay of the reconstruction results with orthogonal slices of the head and brain, helping to pinpoint the site of activity. **SOURCE 5** uses spherical (EEG and MEG) or pre-computed, standardized, realistically shaped volume conductor models (EEG) for source analysis.

SOURCE 5 can be used on PCs and laptops running Windows 2000 or XP. It is aimed at functional mapping



and evaluation of brain activity, in a research context. However, the functionality offered and the evolutionary nature of **SOURCE 5** also makes it suitable for wider application.

Current density reconstructions, deviation scans, and the generation of individual realistic volume conductor models are made available in Compumedics Neuroscan's premiere multi-modal neuroimaging software, **CURRY 5**.



The dipole solutions, confidence ellipsoids, electrodes, landmarks, volume conductor model, skin, skull and brain can be displayed at the user's discretion.

SOURCE Solutions Simplified and Refined

Short Overview of Functionality

User Interface

The entire functionality of **SOURCE 5** is made available through a highly interactive, configurable, single-layer, Windows-standard user interface similar to CURRY 5.

Data Analysis

After re-referencing, filtering, template matching, artifact rejection, baseline correction, and noise estimation, **SOURCE 5** uses a principal component analysis (PCA, SVD) or Independent Component Analysis (ICA) to visualize the spatio-temporal features of EEG or MEG data.

Volume Conductor Models

SOURCE 5 can perform source reconstruction using the well-known spherical shell volume conductor models. However, one of its powerful features is to use a high-resolution realistic head model based on anatomical information. Such a realistic volume conductor model derived from averaged MR Images increases the accuracy of the reconstruction algorithms.

EEG signals and, to a smaller extent, MEG signals, are distorted by the electrically conducting head. Modeling of the compartments of the head using the Boundary Element Method (BEM) improves the accuracy of source reconstructions.

SOURCE 5 comes with pre-computed realistic head models that are applicable to all EEG data, including an FEM mesh with anisotropic skull layer.

Dipole Fits

Based on the measured EEG or MEG data, the sensor positions and the volume conductor, a fit of one or more dipoles can be created. The position of the dipoles can be completely free (moving dipole) or can be restricted (rotating or fixed dipole, mirror or regional constraints).

Dipoles can be constrained to stay in the vicinity of a given location. Thus, it is possible to include prior knowledge from imaging modalities such as fMRI, PET, or SPECT.

Dipoles can also be fitted according to the MUSIC metric. MUSIC stands for Multiple Signal Classification. If more than one dipole is computed, the fit is performed recursively (RAP-MUSIC).

For each fitted dipole, a confidence ellipsoid is computed which visualizes the localization accuracy, corresponding to the signal-to-noise-ratio of the data.

Working without Individual Anatomical Data

If no anatomical data is available, **SOURCE 5** automatically uses its built-in average MRI data set.

Image Processing

SOURCE 5 has tools for reading and thresholding many different types of medical 3D image data.

Viewing of Results

Sensors, landmarks, and dipole fit results with their corresponding confidence ellipsoids can be viewed in 3D images and in 2D images.

Documentation of Results

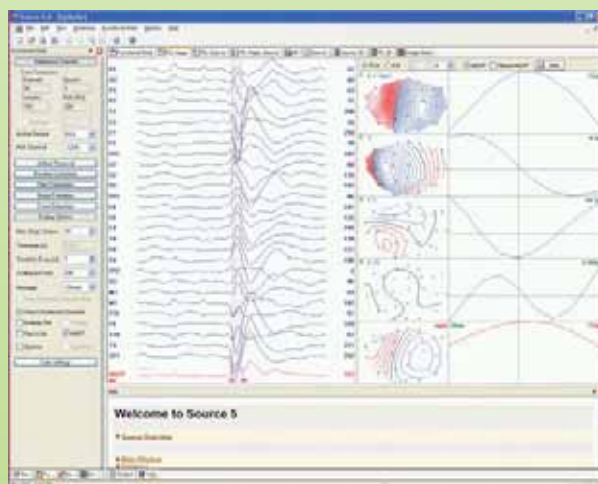
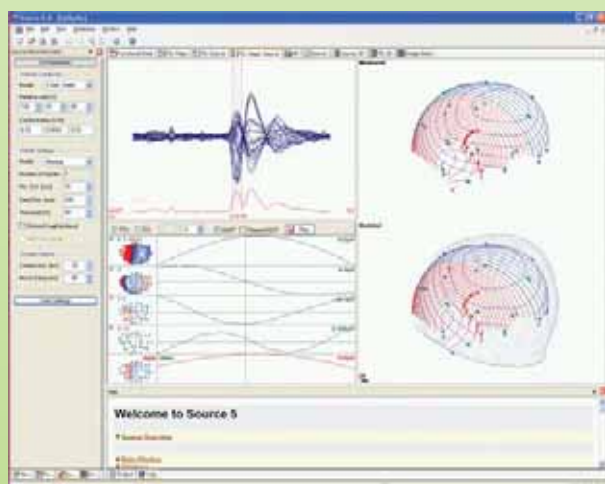
SOURCE 5 provides logging to a window with selectable verbosity. Extensive hardcopy features create .bmp images and .avi movies.

Database

All data files, result files, and configurations are organized using a database. This makes it possible to access multiple data files (functional data, anatomical data, digitizer files, results, default parameters) with a single mouse click.

File Formats and Compatibility

SOURCE 5 reads a broad variety of EEG, MEG, digitizer and image file formats. Comprehensive data import wizards are used to assist importing data formats such as, DICOM, ACR-NEMA and EDF. For a complete list of supported formats, please visit the www.neuroscan.com website.



Highlights

- Integration of EEG, MEG, ECoG with MRI, fMRI, CT, PET, SPECT.
- Complete data processing from filtering to SOURCE analysis.
- Principal and Independent Component Analysis (PCA, ICA) and filtering.
- Pre-computed Boundary Element Method (BEM) and Finite Element Method (FEM) head models.
- Dipole fits. Moving, rotating, regional, fixed coherent, and fixed MUSIC models. Dipole confidence ellipsoids are computed.
- Windows multi-document user interface.
- Data import wizard for functional data.
- Thread-based multitasking.
- Context-sensitive HTML help system.
- Online updates.

Computer Platforms

- PC with Windows 2000 or later.
Windows XP Professional recommended.
- Multi-processor support.
- 1GB RAM recommended.
- Wheel mouse support.
- 1280x1024 screen size recommended.

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