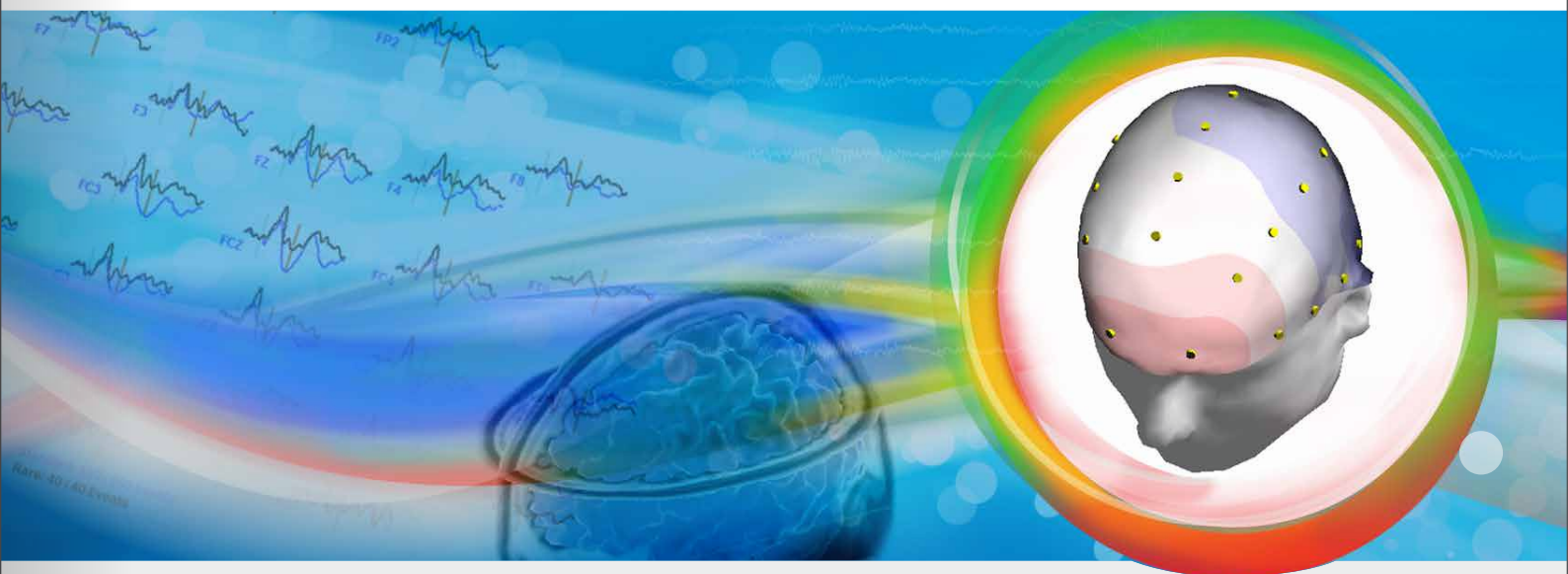


# asa<sup>TM</sup>

EEG & MEG analysis and MRI integration

**MATLAB**  
compatible



Advanced source analysis.

  
**ant** neuro  
inspiring technology

asa™

# EEG & MEG analysis and MRI integration

asa™ is a highly flexible software tool combining functional brain imaging with the visualization and integration of morphological and functional information obtained from MRI and fMRI. It includes a variety of source localization methods, signal analysis and MRI processing features for application in noninvasive functional EEG/MEG brain imaging.

asa gives a realistic impression of your experimental configuration together with topographical mapping of EEG, MEG and the results of your analysis. The asa environment is particularly attractive for those that wish to develop their own

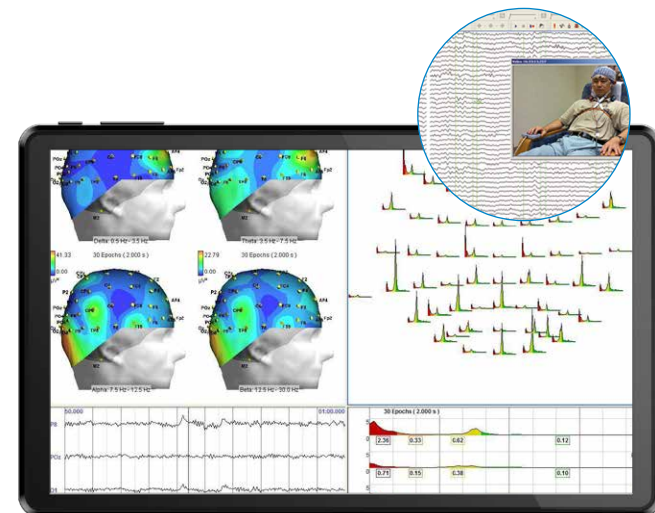
methods in third party packages like MATLAB™ and who use asa in pre-processing and 3D visualization purposes. asa allows to process complete studies in automatic batch mode and to exchange data with MATLAB for further analysis.

## Pre-processing

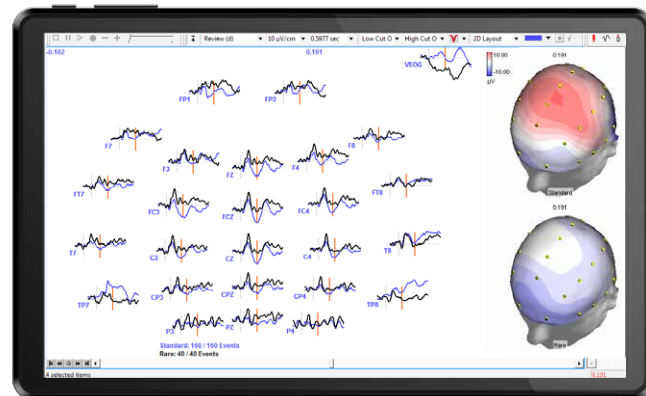
- EEG/MEG review capabilities and support of most EEG/MEG file formats: paging, scrolling, event marker review, different editable montages, filters
- Compressed display (minutes and hours of recording in one page) and compressed spectral density array (CDSA)
- MRI import (DICOM, Analyze, Nifti, asa) and review of images
- Full support of event information, easy navigation through events in the data
- 3D EEG/FFT mapping completely synchronized with EEG and event table
- Automation via scripting (VB, VBA, Javascript, MATLAB, COM support)

## EEG/ERP signal conditioning

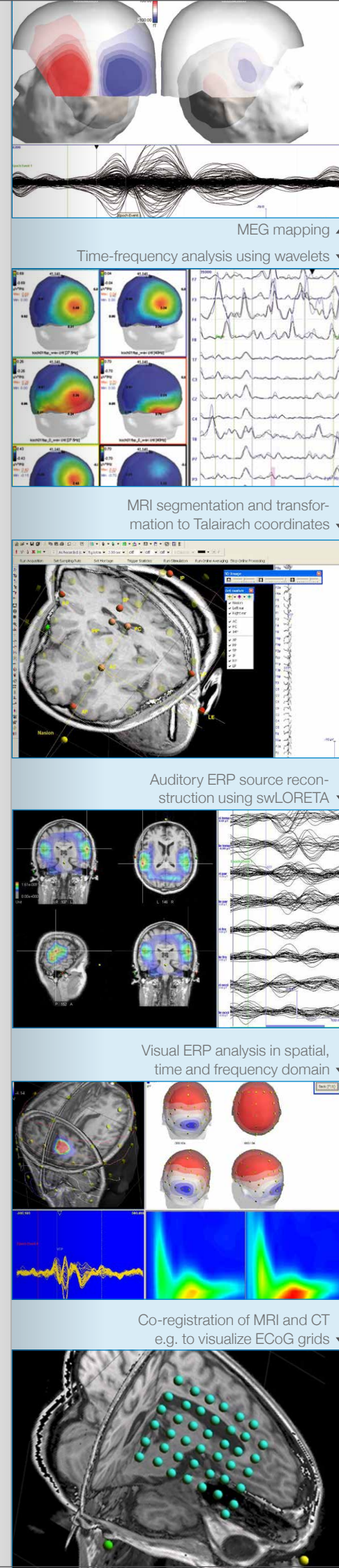
- Filtering, artefact detection, baseline correction, detrending, data template subtraction for artefact removal, grand averaging
- EOG artefact correction based on blind source separation (SOBI)
- (Grand) averaging over multiple conditions
- Interpolation of bad channels
- 3D Current Source Density (CSD, surface Laplacian) mapping
- Event-Related Desynchronization (ERD) based on band pass filtering and Hilbert transform
- Data export in various formats such as asa, ASCII and EDF+ format
- Channel interpolation feature to select the nearest number of neighboring electrodes used for the spline interpolation calculation to generate illustrative data representation



EEG review with video and spectral maps



Average waveforms and 3D mapping



## Integration with third-party software

- Interaction with programs such as MATLAB and other advanced analysis packages
- Library of MATLAB functions for data import/export
- COM interface for advanced scripting

## Time-frequency analysis

- Coherence mapping and phase analysis, based on FFT and wavelets, with display of amplitude and phase coherence in adjustable frequency bands by means of arrow plots
- 3D FFT mapping and spectral analysis, adjustable to specific requirements, with comparison of groups vs. single subject spectra
- Event-related/EEG wavelet analysis and wavelet mapping

## MRI and head modeling

- Automatic segmentation of MRI/CT data
- Generation of realistically shaped head models based on Boundary Element Method (BEM)
- Standardized MRI, head models and electrode configurations for all methods, EEG and MEG
- Fuse MRI images comprising inverse solutions with fMRI, CT and SPECT images
- Transformation to Talairach system

## Source reconstruction

- Multiple spatio-temporal dipole modeling
- MUSIC (multiple signal classification)
- Forward simulation of EEG and MEG
- True 3D reconstruction in frequency domain
- LORETA (low resolution tomographic analysis) sLORETA; swLORETA
- Cortical imaging

## Advanced signal conditioning

- EOG artefact correction based on blind source separation (SOBI)
- TMS artefact correction for mono- and biphasic magnetic pulses

## Latest features

- EDF+ importer/exporter; Valor Nervus importer, Xltek importer
- Export of frequency dipoles – e.g. sLORETA results – as ASCII files
- Display filter and filter feature: user can now choose between a Forward Filter (IIR, no delay) and a Zero Phase Filter (FFT, no phase shift)
- Updated Deltamed Coherence EEG importer
- Support for 64bit CNT format

# asa™ extensions

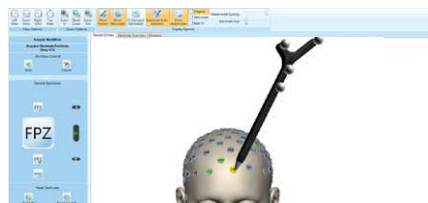
## eego™mylab streamlined recording

**eego** mylab is a dedicated solution for EEG recording, providing an easy to use interface with focus on optimal acquisition workflow and efficient data management of multiple patients, subjects and recordings. **asa** can directly import EEG data recorded with **eego**, including impedance, triggers, annotations and video. Data can be transferred in raw format or including predefined montage and filter settings.



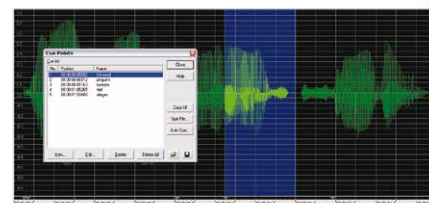
## xensor™ 3D electrode digitizer

**xensor** takes care of the electrode position digitization procedure, using a 3D infrared camera for realtime tracking with exceptional accuracy. Your source localization results will profit from precise, individualized electrode position information that can be matched to individual head models and 3D images. **asa** can directly import electrode positions recorded by **xensor**.



## eevoke™ exciting presentation made easy

**eevoke** provides you with a dedicated tool for visual and auditory stimulus presentation in cognitive research, enabling the development of intelligent experimental paradigms that match your theoretical model. This Microsoft Excel® based experiment generator brings even the most complicated paradigm down to a manageable structure that is easy to use. Behavioral analysis is supported through automatic logging of subject responses. The **eevoke** presentation package will run your paradigm with precision timing.



## Choose your license type

### Single license

Includes 1 USB dongle and allows one single user to operate the **asa** software in different physical locations.

### Network license

A combined license including two dongles: one single license dongle and one network dongle.

The network dongle allows analysis with the **asa** software for 10 concurrent users in one network.

License packages	ASA - ERP Single or network license	ASA - PRO Single or network license
EEG viewer	✓	✓
2D views	✓	✓
Signal processing	✓	✓
3D mapping	✓	✓
Spectral analysis	✓	✓
MEG	--	✓
Head modeling	--	✓
MRI support	--	✓
Source reconstruction	--	✓
Spike and seizure detection	--	✓

Note: recording system can be purchased separately

**asa**™ is intended for research and educational purposes only. Manufactured by eemagine Medical Imaging Solutions GmbH, Berlin, Germany, ISO 13485 certified. ANT Neuro and eemagine are part of the neuromotion group. The information in this document is not intended for users outside the European Union. For more information and most recent updates about **asa** please refer to our website.

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Information in this document is subject to change.

[www.ant-neuro.com/products/asa](http://www.ant-neuro.com/products/asa)

### System requirements for asa 4.10.1

- Operating System:  
Windows 7 / 8.1 / 10 Professional  
32 / 64 bit English
- Processor:  
Intel Core Quad CPU 3GHz or better
- RAM:  
3 GB or more
- Graphics Card:  
Minimum requirement is DirectX10
- USB:  
1 USB2 port for dongle use