CIVA 2017: Discover the latest release of the reference simulation and analysis software for NDE

The simulation and analysis platform for NDE

CIVA can simulate the most common inspection methods used in the industry, plus new and innovative technologies.

CIVA 2017 comes with numerous new capabilities including: **Revolutionized Parametric and POD studies** thanks to **metamodels**, a new **UT probe library**, enhanced **TFM** tools, new powerful UT analysis tools**, Pulsed Eddy Current** simulation, **SART** reconstruction in CT and much more.

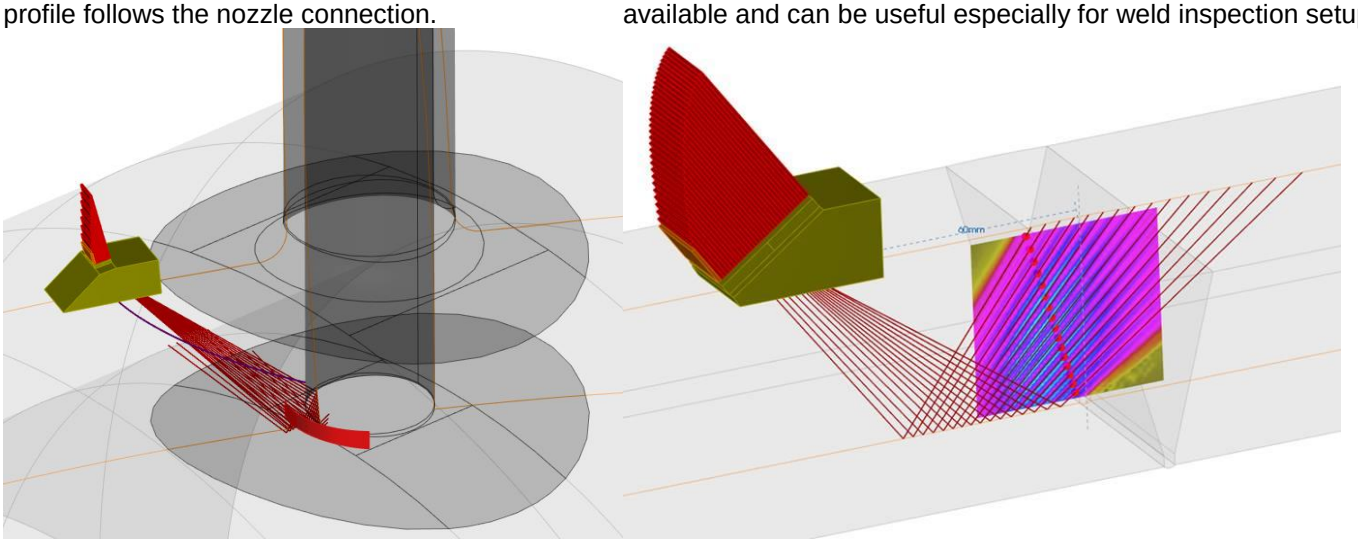
Built-in library of UT industrial probes:

Asked for a long times by the users: A **library of classical industrial UT transducers is now delivered with CIVA**. Numerous probes from *GE* and *OLYMPUS* catalogues are available as a built-in library within CIVA UT to ease and secure the definition of input data. Tools for *IMASONIC* probes definition are also integrated.

Weld and Nozzle inspection simulation improved :

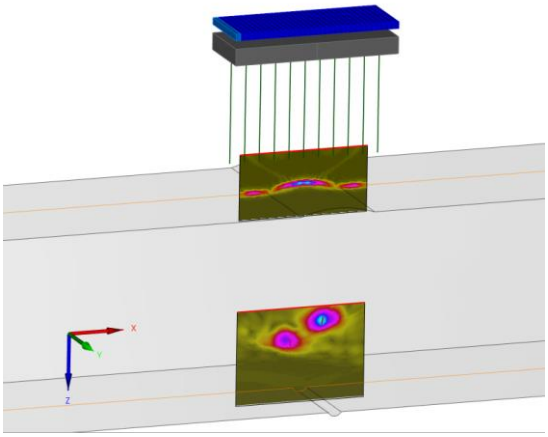
New tools and capabilities are given to help the user for **Nozzle Inspection**: An **exclusion zone** can be defined around the weld to define only relevant scanning patterns that are possible in the real component. A new defect type "**orthoradia**l" is now available, a typical defect for which the profile follows the nozzle connection.

Enhancements for weld inspection also comes with the possibility to **visualize the HAZ**, to locate and orientate automatically defect versus weld chamfer geometry. For Phased-Array applications now, it is also much easier to compute the focal laws even in heterogeneous welds (or other heterogeneous components). New **phased-array settings "direction and distance"** are now also available and can be useful especially for weld inspection setups.

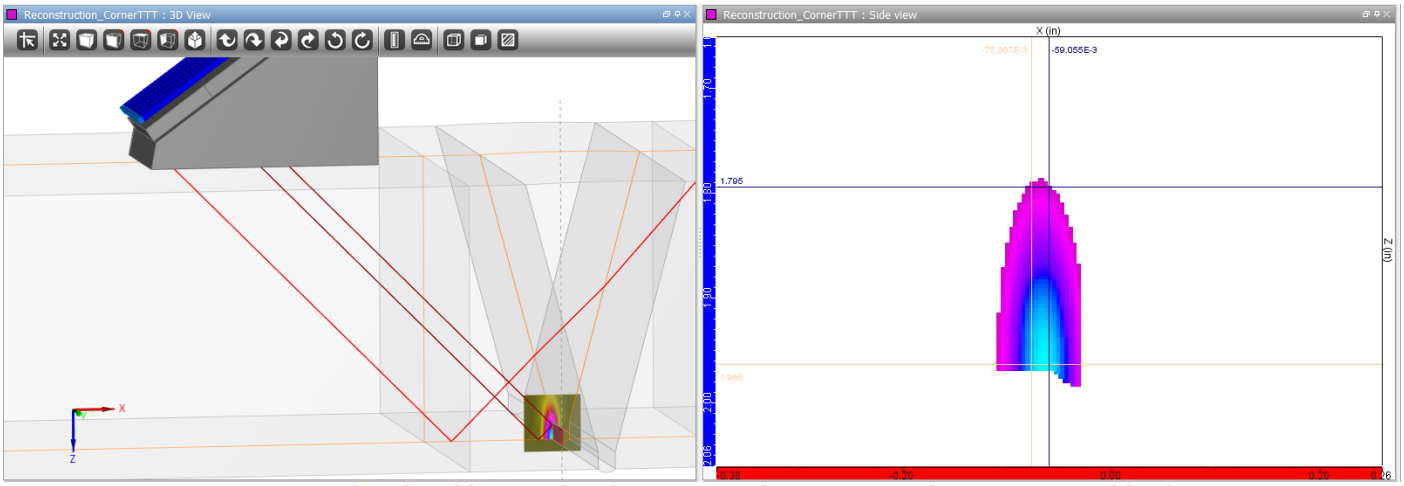


Enhanced Total Focusing Method tools:

The TFM method becomes more widely used now as it demonstrates good efficiency for many applications for both defect detection and characterization. More simulation capabilities in TFM are provided in this CIVA release: **PWI-TFM** (Plane Wave Imaging TFM), **ATFM** (Adaptive TFM), **Sliding TFM** (along the probe scanning), Possibilities to program TFM reconstruction before running the simulation making TFM computation **fully compatible with parametric studies** and batch computations, additional advanced options (mode combinations, filters,…), **enhanced analysis** tools for TFM (T-Scan view, thickness images, cursors, etc.).



ATFM



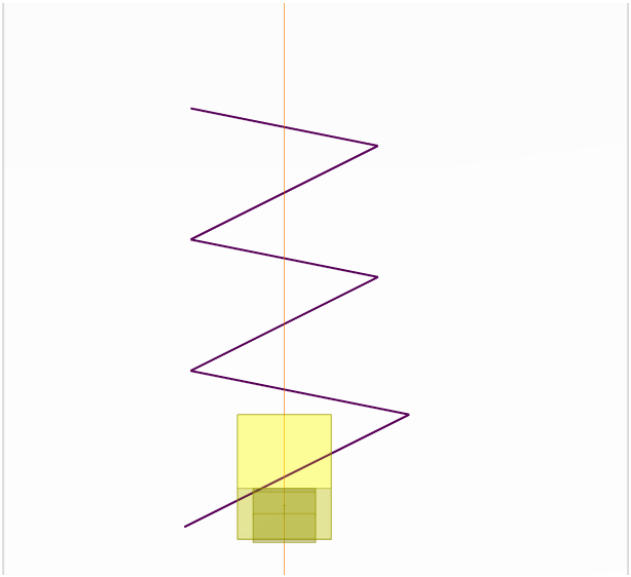
TFM on a surface breaking notch using corner echo reconstruction: T-Scan et Side view

FEM inside! For some applications with planar defects, a **new 2D and 3D FEM model is implemented in CIVA UT** to address defect response computations. It can be very useful when you are out of the validity domain of semi-analytical models (small defect, critical angles, etc.). This model is simply available as a “Transient FEM” option in the simulation settings and is available for surface breaking (on planar back wall) or embedded rectangular defects. The coupling of CIVA UT with CIVA ATHENA2D is still available and relevant for many applications, as well as the CIVA FIDEL2D (Finite Difference) model for composite applications.

And also:

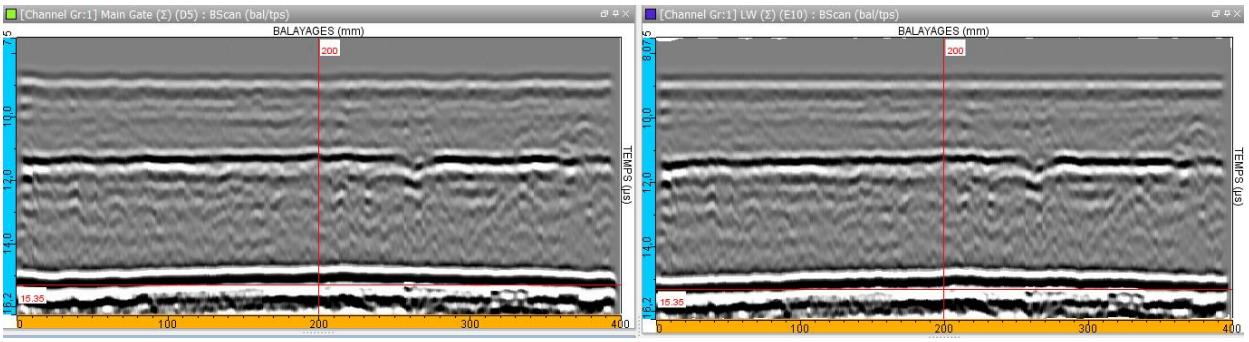
Kirchhoff model was not always available **for geometrical echoes** (for instance computation in 3D CAD component or interface echoes calculation). As it can be more precise than the specular one in complex geometries, this model can now also be used for these cases.

CIVA 2017 also includes in UT the definition of **complex and robotic scanning patterns** based on the definition of a list of points.



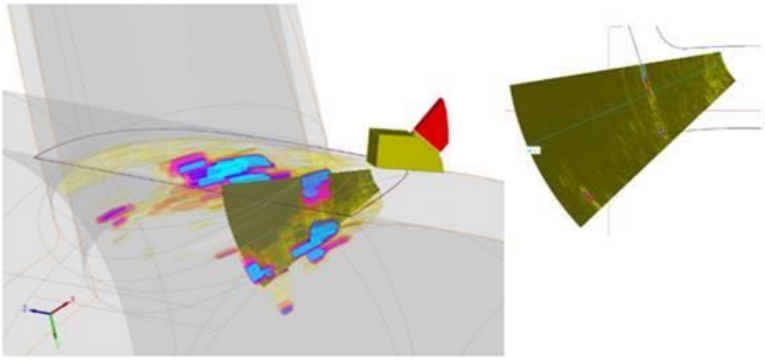
Robotic/Complex scanning patterns definition

Numerous new features are included in the **UT analysis** module among which **lateral wave linearization** and deletion in TOFD, optimized segmentation, **analysis procedure automation** capabilities with templates, compatibility with Gekko acquisitions with Rotated Arms and Nozzle inspections, Plug-In capabilities to apply specific analysis procedure and report on any data acquisition format.



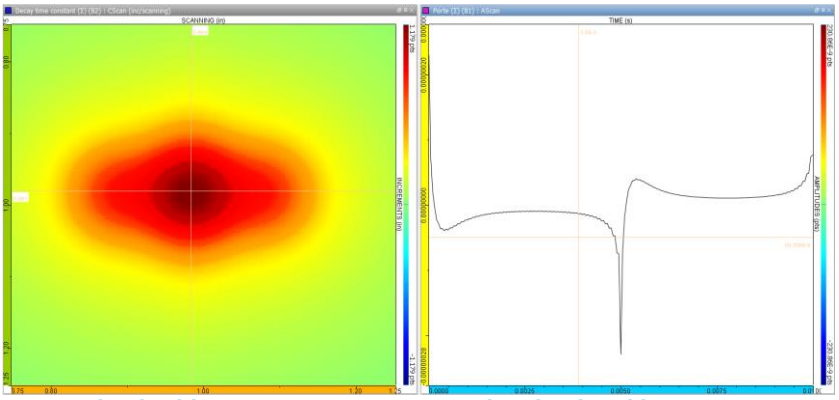
TOFD Lateral wave linearization

The new features mentioned above **regarding TFM imaging & analysis** will be also useful in the context of acquisition **data** analysis. Also remember that CIVA Analysis allows you to read data not only acquired with M2M and GEKKO® but also OLYMPUS systems (RDT, OPD, OUD formats) and that you can also **read the data acquired by other systems** through the application of a development kit including a **plugin for data reading**. EXTENDE can provide services to support the implementation of such a plugin.



Nozzle Inspection – UT Analysis

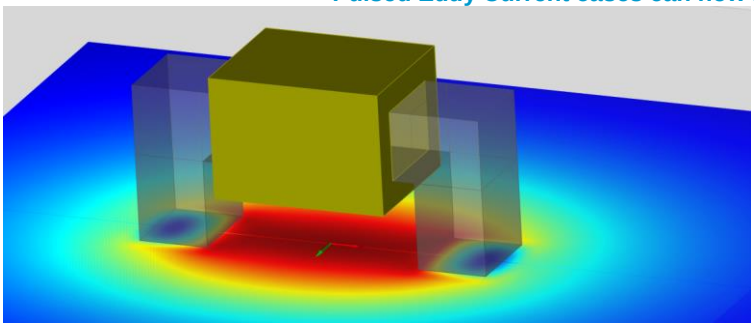
A major new feature of CIVA Eddy Current deals with the modelling of the ***Pulsed Eddy Current technique***. Mainly used for corrosion or other applications involving large lift-off or depth inspection. CIVA can simulate various pulse profiles and will compute the received signal for different probe configurations. Analysis is then made through various quantities (C-Scan, A-Scan, decay time constant graph, etc.).



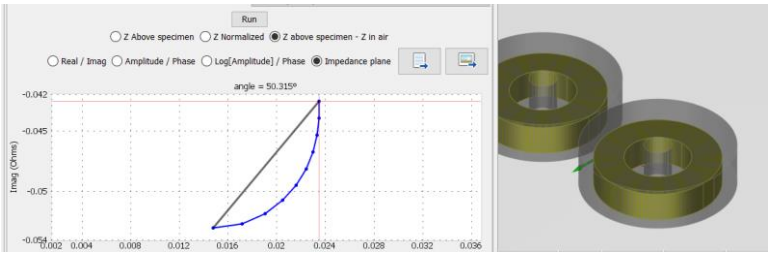
Pulsed Eddy Current cases can now be simulated in CIVA ET

One can also mention a new ferrite probe available with the '**U-YOKE**" shape that can be now simulated.

CIVA 2017 also gives the possibilities to compute quickly the **lift-off signal of a separated function probe**, very useful for calibration stage and for selecting a suitable probe. This feature was limited to common function sensor until now.



U-YOKE Ferrite sensor, available with one or several coils



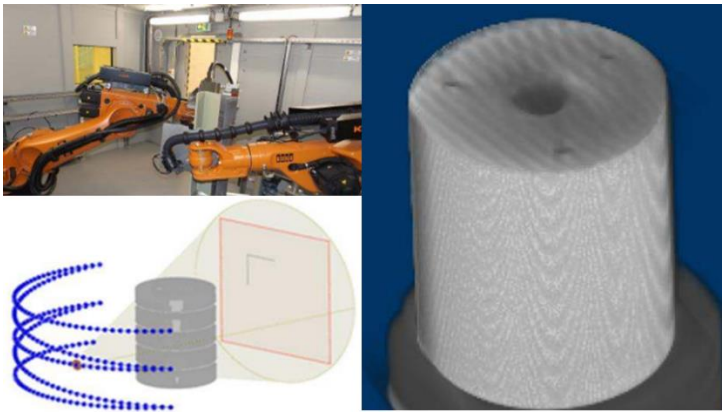
Lift-off Signal computed on a separate Transmit-Receive Probe

.

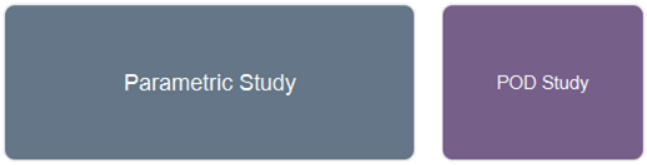
SART and new trajectories available in CT:

It is sometimes efficient, more adapted, or even mandatory, due to various constraints, to perform CT acquisitions with other trajectories than classical ones (circular or helical). Therefore, it is now possible to import **complex and robotic trajectories** in CIVA CT simulations. Associated with this, a new reconstruction algorithm, called **SART**, is now available.

The **performance and robustness** of the CT module have been also **largely enhanced** with this release.



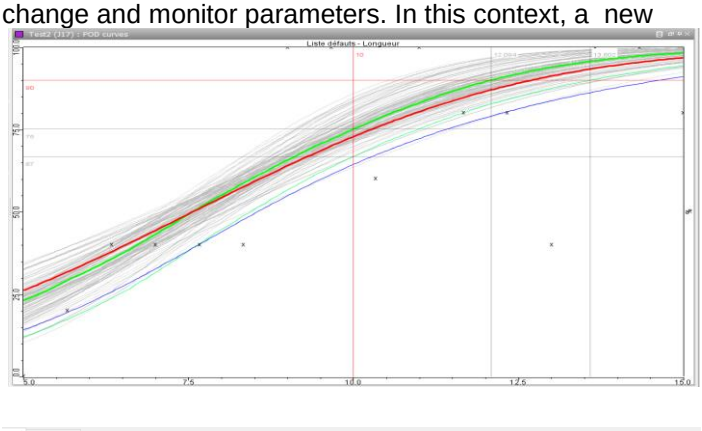
CT Scan and SART reconstruction

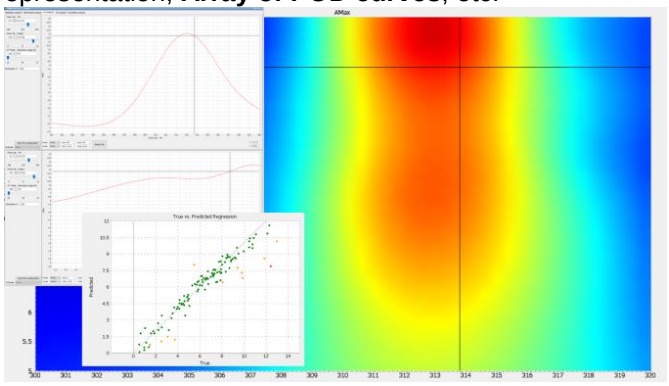


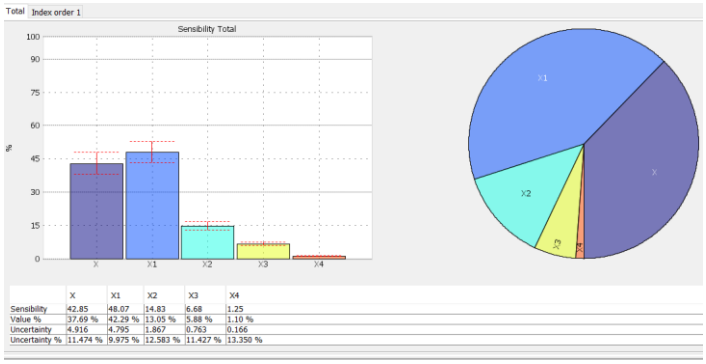
Metamodels revolutionizes parametric and POD studies :

To understand and quantify the impact of influential parameters on a NDT inspection, simulation in CIVA is particularly adapted since it is easy and fast to precisely change and monitor parameters. In this context, a new approach to run parametric or POD studies is now possible. Based on a first set of computations, **metamodels** (i.e. « model of the models ») can be calculated in CIVA. From this database, numerous sets of new results can be predicted and are **given to the user in real time**! Parametric studies are now more powerful thanks to new analysis tools and more advanced options: **Multi parametric analysis**, **Sensitivity analysis** to evaluate relative impact of influent parameters, etc.

POD analysis is also greatly enhanced with additional statistical criteria, new operators for data set representation, **Array of POD curves**, etc.







Enhanced capabilities for parametric and POD studies thanks to metamodels

Very good news for our Far East users: CIVA 2017 is ***now available in Chinese language!*** This process will be followed with other languages in the near future.

Many developments have been made to expand the capabilities of CIVA but as usual, a new release also brings the benefits of various performance improvements (including the parallelization of some calculation processes but also corrections of the malfunctions brought to our attention during the past year). We hope you enjoy this new version and its many improvements. Of course, we are pleased to continue collecting your feedback on CIVA.
Your input drives what features will be added and what improvements will be made to CIVA in the future!

Please find a complete description of CIVA 2017 on our website: www.extende.com