CIVA 2020: Don't miss the latest release of the leading Simulation & Analysis software for NDE

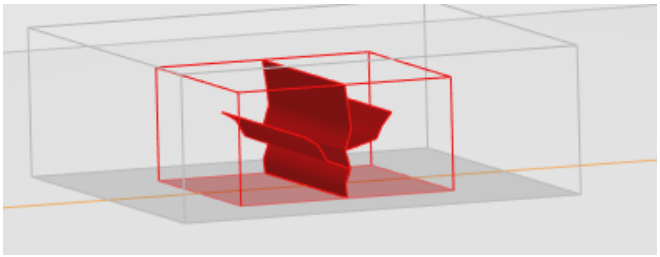
The simulation and analysis platform for NDE

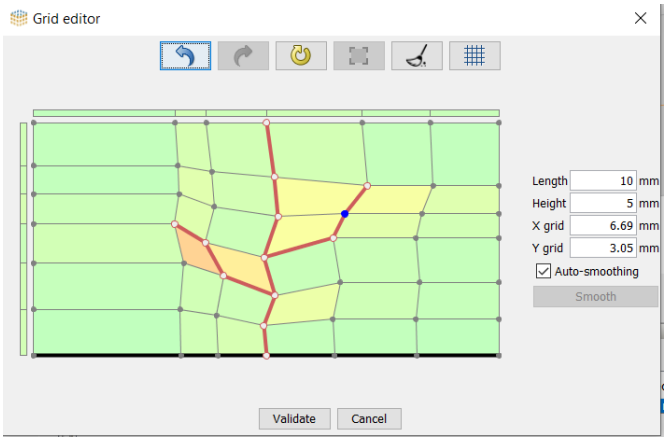
CIVA simulates the most common inspection methods used in the industry, plus new and innovative technologies.

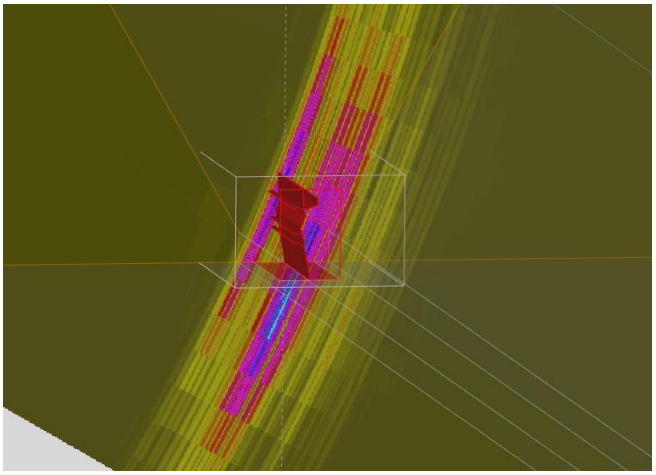
The new version **CIVA 2020** includes significant enhancements both in terms of functionnality and performance, including : An integrated tool for **DAC Curves and TCG computation,** especially for phased-array sensors**,** a further integration of **FEM tools within CIVA UT**, a dedicated **environment for nozzle UT inspection**, a **linear scan** module in RT and CT, new defect profiles in **ET**, a **modes identification tool in GWT**, and an enhancement of the **metamodels** capabilities and its extension to the RT and GWT modules.

FEM calculation within CIVA

This version includes important enhacements of the capabilities of the **2D and 3D hybrid FEM models** (which had been introduced in CIVA UT 2017 in addition to the semi-analytical models historically available in CIVA). It is now possible to simulate defects with **complex shapes** with such FEM models **directly in CIVA UT** (surface breaking with planar or cylindrical back walls, embedded defect, and for any type of metallic component) in order to deal with issues such as defect tip sharpness impact, defect sizes below the wavelength, or complex wave modes generated on the defect interaction such as creeping waves. Some **random variability** can also be introduced in the crack morphology to evaluate its impact on the detection sensitivity.

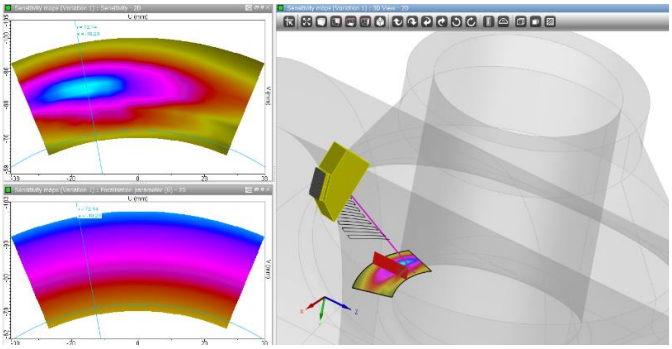


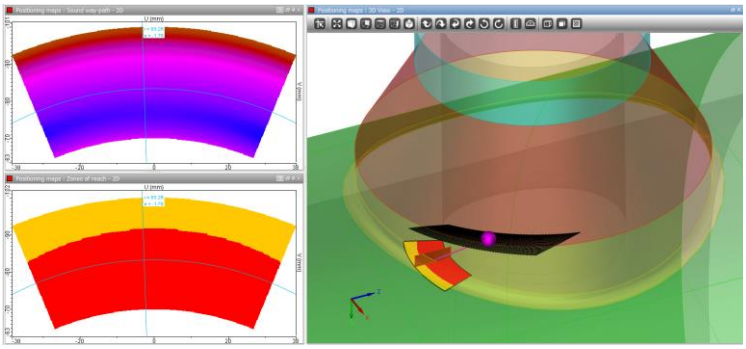




"Nozzle Perspective":

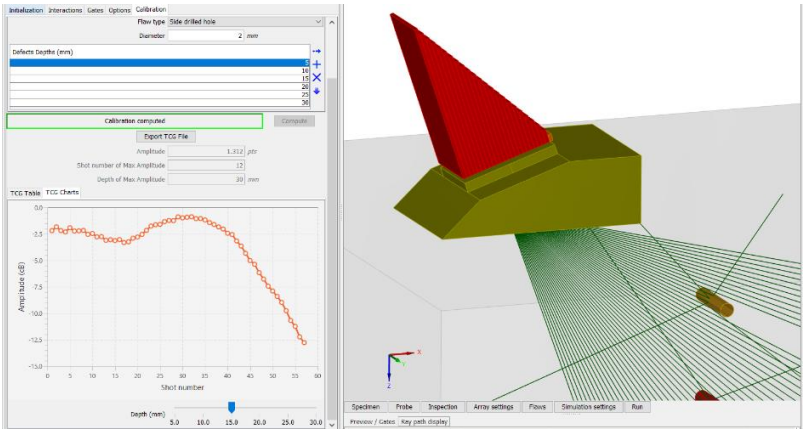
This new release also introduces a dedicated environment for nozzle inspection. The goal here is to provide some tools to help optimize the inspection of such complex components. For instance the probe can be positioned with **accessibility maps**, followed by **sensitivity maps** to visualize the defect ultrasonic amplitude response as a function of incidence angles or transducer positions, while defining scanning patterns, focal laws and optimal configurations.

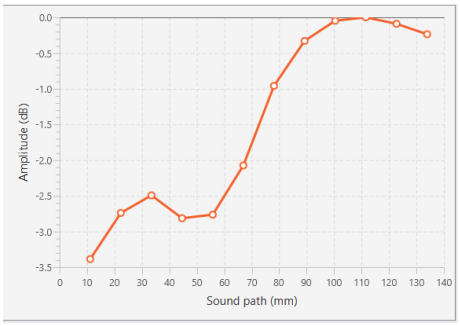


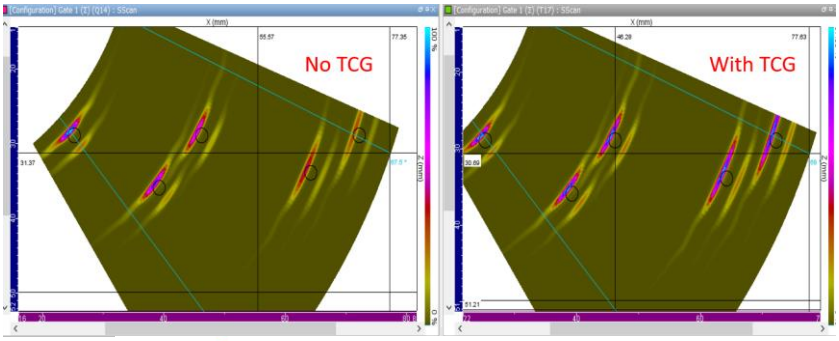


Integrated DAC/TCG calibration tool, compatible with phased-array sensors:

The computation of **DAC/TCG** calibration curves is now compatible with phased-array sensors with multiple shots, such as several angles for **sector scan** applications, or several sequences for **linear scan** applications, thanks to a dedicated calibration tool implemented in the Simulation Settings pannel. The TCG correction can also be applied in post-processing. This new calibration tool is also available with conventional transducers which provides a fast and easy way to compute and display DAC curves.

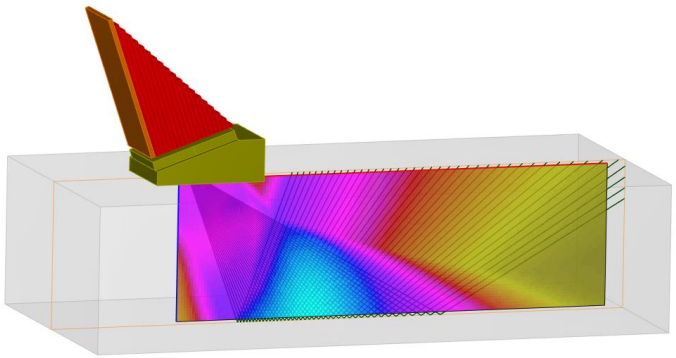






Improved beam calculation performance:

The beam computation has been optimized when selecting the option "Max Beam Only" leading to **faster and more robust computations** especially when the calculation area is large and/or the number of shots, modes or skips is important. In addition, thanks to this option, the user can also directly obtain at the end of the calculation process the Transmission/Reception beam and the cumulated field, in the case of multi shots or multi angles beam (sector scan), without need for a further post-processing.

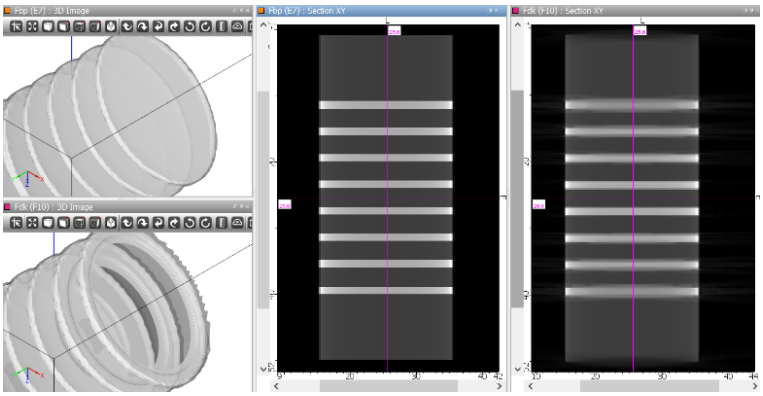


And also…

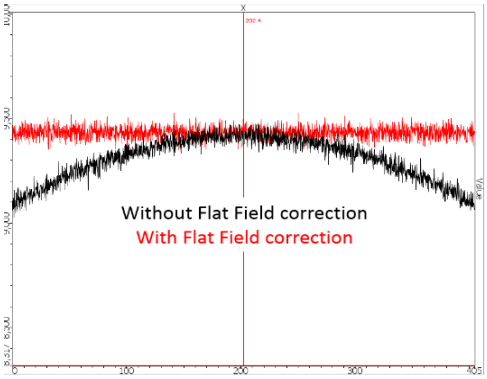
Other new features can be mentionned such as the ability to account for the full body of FBHs and SDHs, new **elliptical defect** shapes available (quarter, semi, full ellipse) or a new parametric geometry available to easily describe **bimetallic** welds. This is also possible to superimpose 3D CAD objects to any parametric geometry for analysis purposes. Finally, the probe library available in the CIVA probe panel now integrates **EKOSCAN PA UT** sensors, in addition to the existing ones.

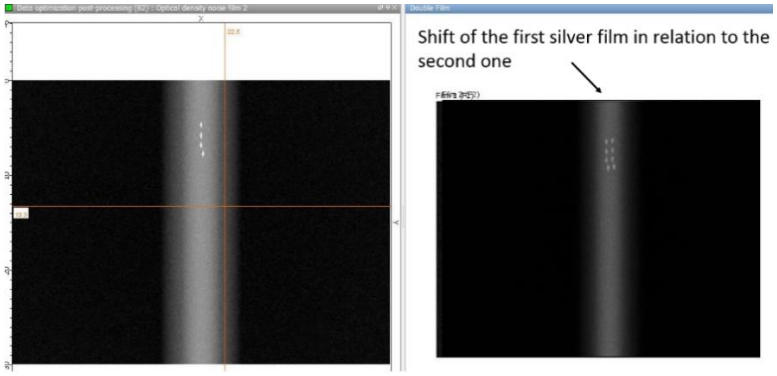
CIVA UT Analysis is up-to-date with the latest version of EDDYFI Systems (GEKKO, PANTHER), it is also compatible with OLYMPUS systems, and does not need any more the Olympus Dongle !! The plug-in data import solution has been improved allowing FMC acquisition data.

The RT-CT module integrates a new application of "**Linear Scan"**. This option is available both in the RT and CT modules. The linear scan of the source used with linear detectors reduces artifacts due to the source divergence. It can be adapted for long specimen inspection or can help improve CT reconstructions with better quality for projection images.

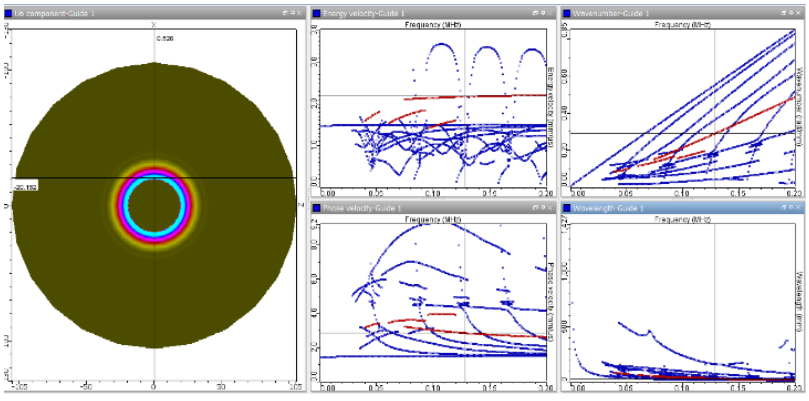


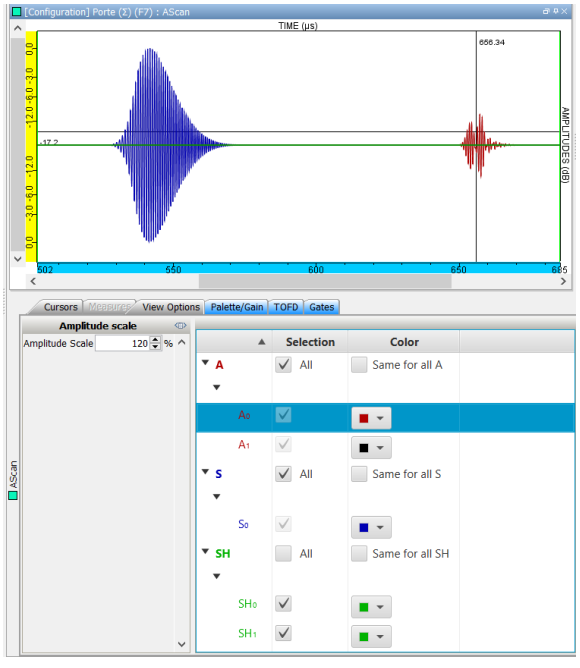
The **computation performance** has been noticeably improved, whether it be for the direct radiation part, or for the scattering radiation with the possibility to sub-sample the detector for the Monte-Carlo calculation, and also to compute only the scattering for the selected projections in CT. CIVA RT can also now read experimental data files through the **import of TIFF file format**. A new feature of **Flat field correction** is also available. Let's finally mention some tools to help qualitative analysis of film radiograms, such as accounting for the saturation of optical density values, a double film qualitative option or the integration of a negatoscope.



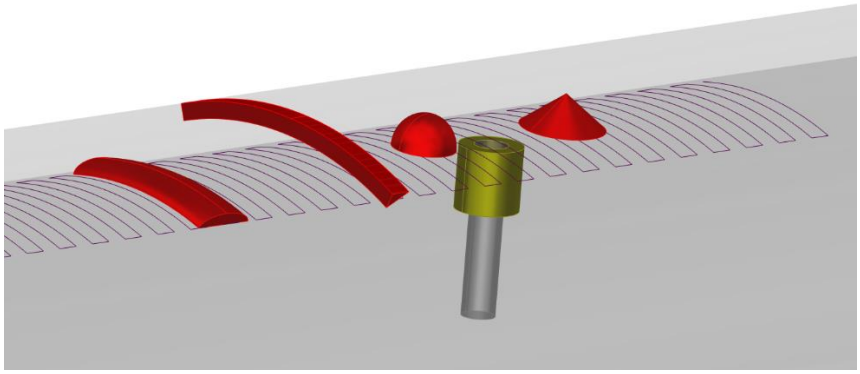


In the Guided Waves module, the modes and their dispersion curves can now been calculated in **buried pipes**. Additionally, a **modes identification** tool is now available to identify individual mode contributions in an A-Scan. Another new feature is the possibility to simulate defects corresponding to thickness beads in components defined with 2DCAD sections.

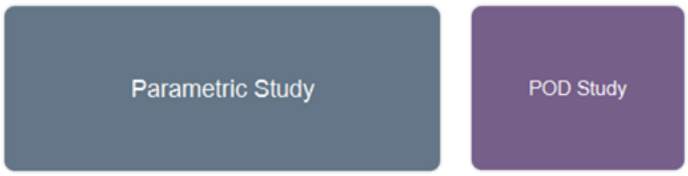




In the Eddy Current module, you can now define **more complex defect shapes in tubular components**, modeling more realistically some drilling defects or corrosion profiles.



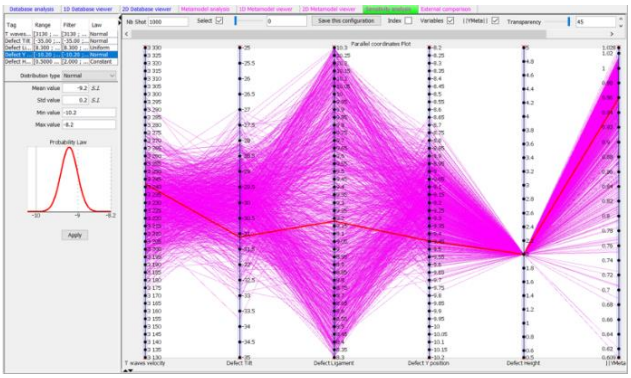
For applications involving fastened plates with rivets, the defect signal can now be directly extracted from the whole signal (including the rivet one). Let's also mention the ability to **display and adjust the mesh** in the 2D cylindrical inspection simulation module (that involves FIT model). Finally, the **Pulsed Eddy Current** models have been noticeably enhanced with the capability to access the back wall signal even if no flaw is defined, the compatibility with the 2D cylindrical module and also with significantly improved computation performances.

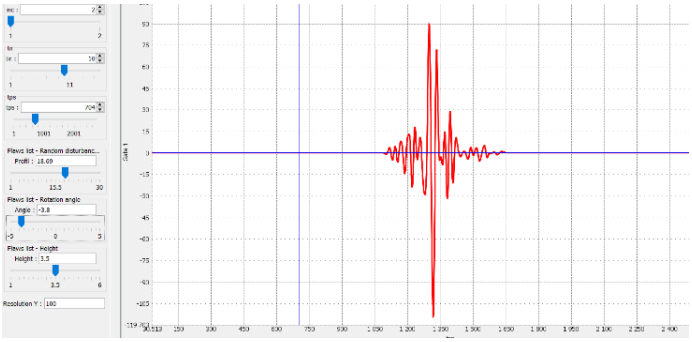


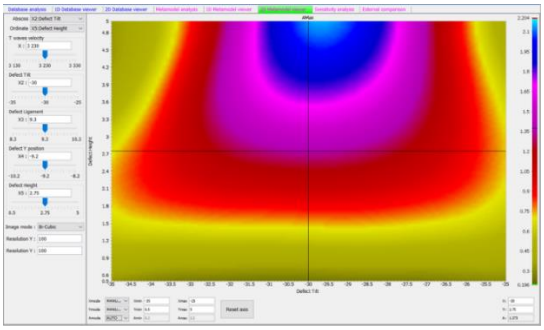
In these contexts, CIVA 2017 had introduced a new approach to conduct such studies through the implementation of metamodels in the UT and ET modules. Another significant improvement of CIVA 2020 relates to these **metamodels**, which are now also available in the **RT and GWT modules**. For the UT and ET modules, the metamodels can now be used for the **full signal** and not just on a single component of the maximum signal obtained on a single defect. It means that you can access **all scanning positions**, **all shots** (PA probes), and the **full temporal waveform** in the metamodel analysis environement. Moreover, interpolator options have been enlarged and the metamodel analysis interface has been improved.

Metamodels revolutionize parametric and POD studies:

To understand and quantify the impact of **influential parameters** on an NDT inspection in the framework of a qualification, a design or an optimization study, simulation in CIVA is particularly well adapted since it is easy and fast to precisely change and monitor parameters.







Finally, the CIVA interface translation efforts are ongoing. Besides English and French languages, CIVA 2020 is ***now available in Chinese, German, Russian and Spanish.***

We hope you will enjoy this new version and its many improvements. Of course, we are pleased to continue collecting your feedback on CIVA. Your input drives which features will be added and what improvements will be made to CIVA in the future!

Please find a complete description of CIVA 2020 on our website: www.extende.com