



## Let's be more efficient with CIVA SCRIPT!

You can save significant time with CIVA Script, especially for large scale computations and analysis work.

### Automate your calculation and analysis loops:

In a simulation project, the time-consuming part is often not the computation itself, but the operations needed to run and analyze simulations one after the other. This can take a lot of time especially with **large-scale studies**. With **CIVA Script**, you can automate extensive calculation sequences and extract results of interest without opening the user interface!

### Optimize your simulation model:

**Design, optimization or characterization** studies often rely on iterative loops. In a simulation context, it means that you need to first analyze results before launching new computations. With **CIVA Script**, you can define your analysis criteria, your target result and then create your **iteration loops** that will monitor CIVA parameters depending on previous analysis results in order to converge quicker to an optimal result!

### Customize post-processing of your simulation results:

CIVA provides results in a NDE oriented analysis environment. But you might want to adapt the analysis results to your application context. With **CIVA Script**, you can export full simulation "raw" data and use your own programming tools and languages (such as Python) to define your **dedicated post-processing operations** (Field or Inspection Simulation analysis, Full Matric Capture (FMC) data for Total Focusing Method (TFM) processing, etc.).

### Drive all parameters, including non-numerical ones:

CIVA provides a parametric study built-in manager, but this one can only drive numerical CIVA parameters. With **CIVA Script**, you can monitor **all types of parameters** (such as CAD files, ultrasound and Eddy Current probe or radiographic source files, trajectory files, etc.) and therefore benefit from the advantages of CIVA Script (automation, optimization, analysis customization, etc.) also for these types of parameters.

### Application Programming Interface (API) with an external software "chain":

NDT is just one stage in industrial design and maintenance works. Simulation software is now sometimes embedded in large multiphysics simulation platforms and database such as in a Product Lifecycle Management (PLM) environment. With **CIVA Script**, launch CIVA without user interface operations and allow **interoperability** between CIVA and other software environment.

## MORE INFO ON CIVA SCRIPT...

CIVA Script is an optional add-on to your license and is **compatible with all CIVA modules**: UT, ET, RT-CT, GWT, SHM, CIVA ATHENA2D, CIVA FIDEL2D.



With CIVA Script, CIVA is driven by an XML file whose features and syntax are defined precisely in the user manual. For more advanced use, you can build and monitor this XML file, **post-process the results and performs series of simulations** thanks to an external programming language such as the open source **Python IDE** or **Matlab**. CIVA Script provides Python and Matlab readers to read binary data files generated from CIVA Script computations.



### TUTORIALS:

CIVA Script material comes with 5 tutorials which have been prepared with Python scripts carefully commented and that can be launched easily through Jupyter notebooks. These tutorials will help you get started with this feature and will provide you with ideas on interesting use cases.

- Tutorial #1: UT – **Characterization** of immersed UT focused probes: Reverse engineering tool UT probe curvature characterization.
- Tutorial #2: UT – **Automation** of beam analyses for various refraction angles, **customization** of beam mapping with max value and location, and analyses reporting in an XLS file.
- Tutorial #3: UT – Use CIVA Script with PA UT probes on FMC-TFM application, **automation** of calculation and analysis **loop** for several reconstruction modes (**non-numerical parameter** in CIVA) and comparison of obtained images and sizing analyses.
- Tutorial #4: ET – **Optimization** of defect mesh parameters until numerical convergence is reached with minimal computation time and **automation** of the calibration process and impedance plane display.
- Tutorial #5: RT – Comparison of several detector performances (**non-numerical parameters** in CIVA) with **automation** of gain calibration.



### CONSULTING:

You have needs but not enough time to spend on it at the moment?

You need a help to prepare your script?

EXTENDE can work on a consulting service basis to create your script, potentially provided with a Graphical User Interface.