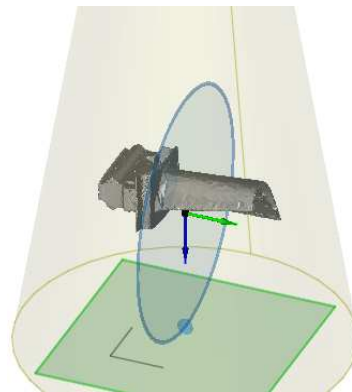




CIVA 10.1: **New CT Module**

A new simulation module is available with CIVA 10.1: **CIVA CT**. With this new tool, a 4th NDT technique joins the CIVA platform: **Computed Tomography (CT)**.



Same interface as the X-ray module

The new CT module proposes the same interface and same capabilities as the RT module in terms of:

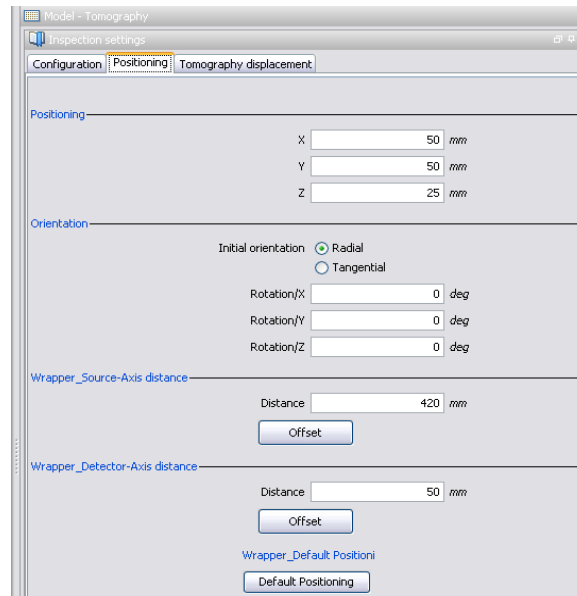
- Specimens
- Sources (X or gamma sources)
- Detectors
- Flaws
- Computation options : simulation of direct and scattered radiation

Specific items are:

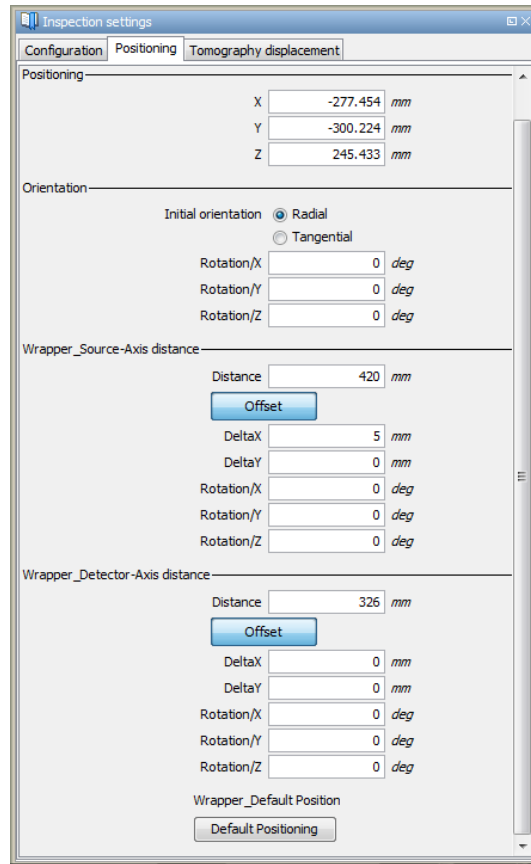
- Positioning
- Tomographic scanning
- 3D reconstruction

Positioning:

A new positioning option allows the user to define the {detector-source} positioning system. The user can now enter the source-rotation axis distance and detector-rotation axis distance in a semi-automatic way.



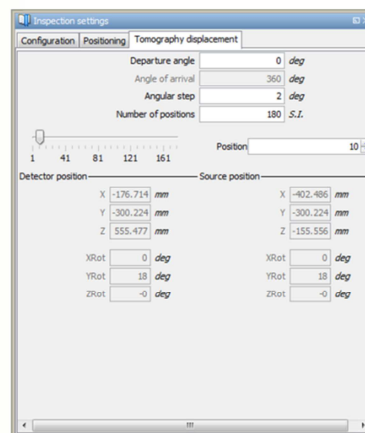
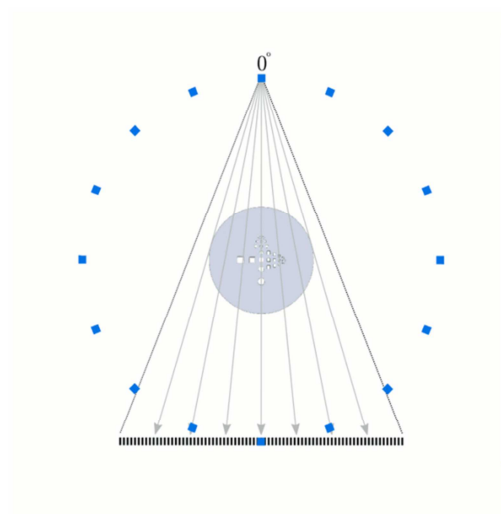
Specific misalignment options complete the positioning options. One can define an offset of the source and/or the detector versus the specimen to be inspected.



Tomographic scanning:

As the part geometry is fixed in CIVA, the X-ray tube and detector rotates around the specimen.

An arbitrary number of steps and shot positions can be defined. Then, CIVA will run the RT simulation for all the projections.



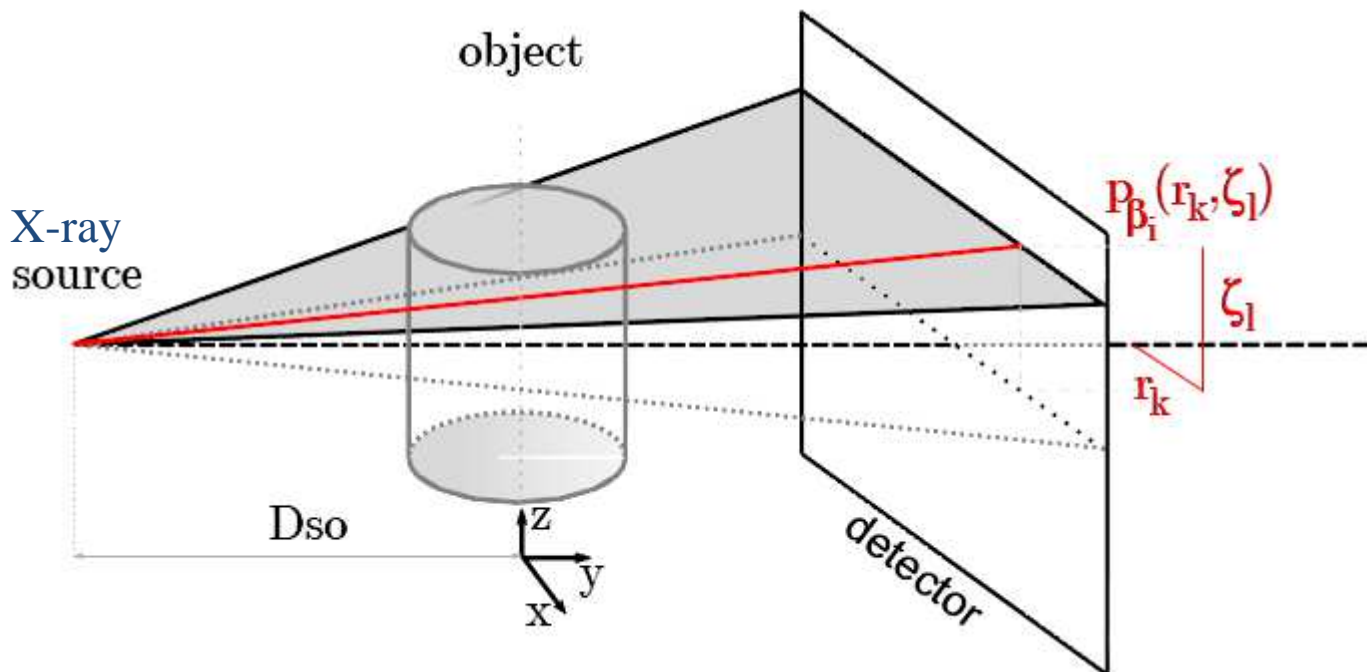
Results for each projection:

X-ray slice data are generated for each position and the corresponding results can be displayed. Those results are identical to the RT module and depend on the detector and the computation options.

All the analysis tools within CIVA RT are also available in CIVA Tomography.

Once the scan data has been acquired, the data must be processed using an algorithm of tomographic reconstruction, which produces a series of cross-sectional images.

3D reconstruction:



The algorithms used in the current release of CIVA are the FDK algorithm (Feldkamp, Davis and Kress) and PIXTV.

- The first one uses the FDK algorithm (Feldkamp, Davis and Kress). The FDK algorithm is a widely used filtered-back projection algorithm for three-dimensional image reconstruction from cone-beam data.
- The second method of reconstruction uses the PIXTV algorithm based on compressed sensing theory. This is an iterative reconstruction algorithm which minimizes the TV (total variation) norm.

