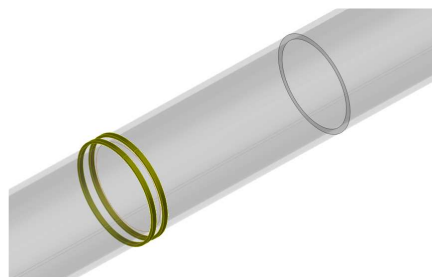




## *Civa Guided Waves: New Module*

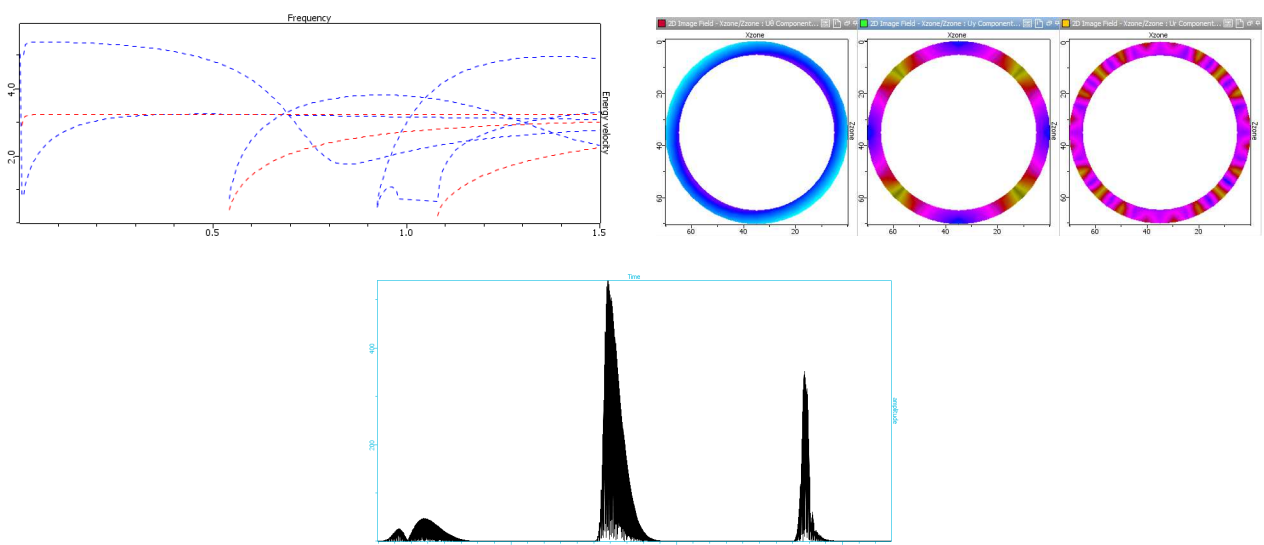
A new module is available in Civa: Civa Guided Waves.



With this new tool, the guided waves are simulated, for single or phased-array probes, in planar or tubular multilayered structures (in the air – no embedded structure). Civa Guided Waves comes with 3 modules:

- Dispersion curves computation,
- Ultrasonic field computation
- Flaw response prediction (flaw perpendicular to the structure - rectangular in plates or sectorial in pipes).

These three modules bring understanding which is helpful at the different stages of probes and testing optimization, from preparation of configuration to quantification of predicted testing results.



This first version allows defining simple configurations, however numerous functionalities and modeling work will be integrated in next versions.

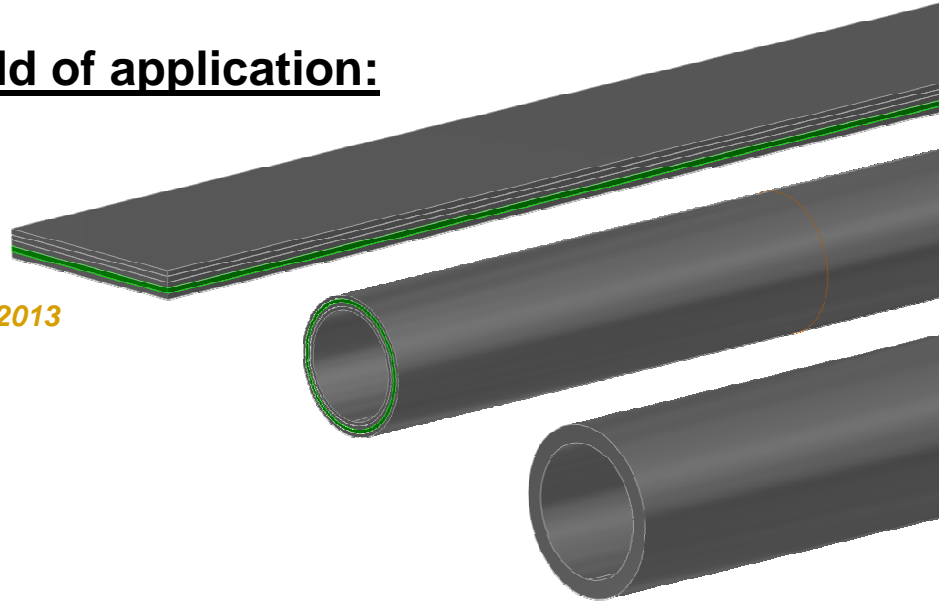
## Civa Guided Waves field of application:

### Specimens

- Plates and pipes
- Multilayered and/or coated
- Arbitrary 2D CAD *expected for 2013*

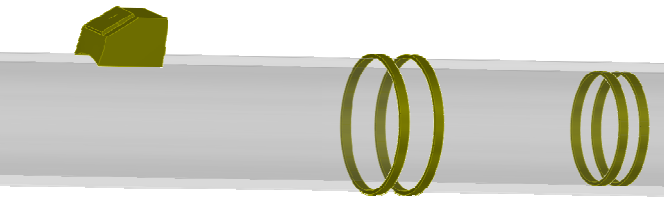
### Materials

- Isotropic
- Attenuation law
- Anisotropic *expected for 2013*



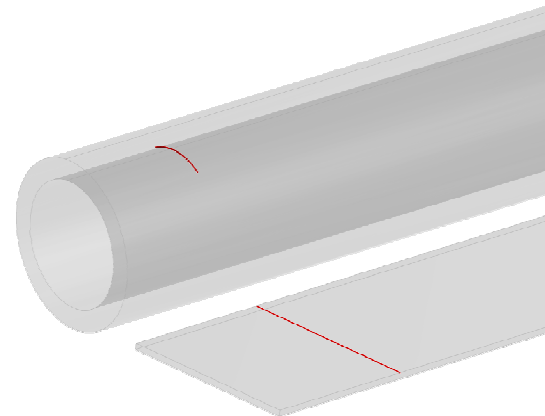
### Transducers

- Contact with or without wedge
- Encircling/encircled probes
- Phased arrays
- Different types of solicitations (shear or longitudinal vibration)
- Different configurations (Pulse-Echo, Pitch-Catch transmission or Pitch-Catch reflection)
- Current modeling work on EMAT, *expected for 2014*



### Flaws

- Crack orthogonal to the guide axis
- Arbitrary number of defects *expected for 2013*
- Defects of arbitrary shape *expected for 2013*
- Waveguide discontinuities *expected for 2013*



### Specific Results

- Dispersion curves
- Displacement and stress profiles (mode shapes)
- Modal amplitude generated by the transducer
- Ultrasonic field in cross-sections of the waveguide
- A-scan measured by the receiving probe
- Parametric variation available
- Mode by mode post-processing *expected for 2013*

