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Non-Destructive Evaluation of Friction Stir Welds for Aerospace Applications

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Non-destructive evaluation (NDE) plays an important role for the acceptance of friction stir welded components in the transport industries. In aerospace, stronger and lighter friction stir welded joints are excellent candidates to replace the majority of fastened fuselage structures. The inspection of these types of welds is not yet clearly established, especially due to specific defects and their random orientation within the weld.

At the National Research Council, an inter-institute collaboration was started in 2007 between the Industrial Materials Institute and the Institute for Aerospace Research with the goal of exploiting their NDE expertise and applying it for the characterization of friction stir welds for various industrial applications. This presentation includes a series of examples of NDE applications for both defect detection, as well as weld characterization. The capabilities and limitations of individual NDE techniques for specific types of welds and defects are discussed in detail.