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***An algorithm for corrosion detection via  
simultaneous reconstruction of material loss and  
energy dispersion coefficients***

Joint work with Dario Fasino (Università degli Studi di Udine, Italy)

We derive an algorithm for the reconstruction of a pair of coefficients that appear in the description of corrosion damages over the top surface (supposed to be inaccessible) of a thin homogeneous metallic plate. Moreover, we suppose that the plate is coated with an insulating film. Laplace's equation holds inside the object and Cauchy data sets can be collected on the bottom side of the plate. We propose the simple physical model in which the first coefficient corresponds to the material loss (boundary identification) while the second one is the transfer coefficient in a Robin boundary condition modeling the energy dispersion due to the local degrade of the insulating film. We expand all the functions in the problem in powers of the width of the plate and produce a Thin Plate Approximation of the two corrosion coefficients. We determine a range of values in which the method is successful.