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**Francisco Javier Sayas\*** ([fjsayas@udel.edu](mailto:fjsayas@udel.edu)), Department of Mathematical Sciences,  
University of Delaware, Newark, DE 19716. *Exotic transmission problems for wave equations and  
how they really are semidiscrete integral equations.*

Several problems related to scattering of acoustic, elastic, or electromagnetic waves can be reformulated using retarded potentials and their associated boundary integral operators. I will focus on simple transmission problems for the wave equation and show how the Galerkin semidiscretizations in space of some time-domain boundary integral equations are equivalent to stable dynamical systems subject to interface excitation. I will then start from the end, presenting more general dynamical systems and show how we can pull back to stable systems of time-domain integral equations describing scattering by obstacles with piecewise constant material properties. (This talk condenses work developed with Antonio Laliena from the University of Zaragoza, Tianyu Qiu from Rice University, and Alexander Rieder from the Technical University of Vienna.) (Received August 29, 2016)