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M. Yvonne Ou* (mou@math.udel.edu), 408 Ewing Hall, Dept. Math. Sciences, University of Delaware, Newark, DE 19716. *On reconstruction of dynamic permeability and tortuosity of poroelastic materials.*

Dynamic permeability refers to the permeability of poroelastic media subjected to oscillatory pressure gradient. It depends on both the frequency and the pore space geometry. The dynamic tortuosity is inversely related to the dynamic permeability and plays an important role in the mechanism of energy dissipation of waves through poroelastic materials. Numerically, dynamic tortuosity is the kernel in the memory term in the dissipation term for time domain wave equations; it is known to be associated with fractional derivative of order $1/2$. In this talk, we will present our results on reconstructing the dynamic permeability as a function of frequency from partial data by utilizing its analytical properties when extending to the complex frequency plane. Using the relation between tortuosity and permeability, a set of quadratures are constructed for handling the memory term in the poroelastic wave equations. (Received September 16, 2013)