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Inferring the relation between radar velocity and permeability: a comparison between tracer test and flowmeter data

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A great deal of interest has developed in estimating site-specific petrophysical relationships between hydrogeological and geophysical properties. We compare two approaches that use either flowmeter (Chen et al., 2001) or tracer test data (Linde et al., 2004) in combination with radar tomograms to infer a petrophysical relationship between radar velocity and permeability, in order to estimate the permeability structure between boreholes. We apply these methods to the Oyster site, VA, and compare the estimated petrophysical relationships. These relationships should be very similar if the assumptions underlying the two methods were fulfilled. We attribute the observed discrepancies between the relationships to space-varying resolution of the radar tomograms, differences in measurement support volume, and the larger sensitivity to 3-D effects in the method that uses tracer test data. We believe that comparisons like this are useful to evaluate the predictive power of hydrogeophysical parameter estimation methods. This work was supported, in part, by the U.S. Dept. of Energy under Contract No. DE-AC03-76SF00098.

References:

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