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Abstract for an Invited Paper
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Theoretical Physics + Experiments in Superfluid He⁴ = Commercial Oilfield Acoustic Service

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I will describe a specific project which involved the understanding of the basic physics of acoustics in porous and permeable fluid saturated media. The end product is a commercially available measurement of the fluid-flow resistance of porous rock in a real oil-field borehole using an acoustic technique. One key ingredient of the understanding was obtained by laboratory measurements of the acoustic properties of a porous sample saturated with superfluid He⁴. Another key ingredient is the theoretical understanding of the properties of the frequency dependent fluid-flow resistance, and its extension to complex values of the frequency.