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by ***Dr. John P. Castagna,***
University of Oklahoma

Identifying Stratigraphy and Fluids Using Spectral Decomposition: The Current State of the Art

Various wavelet transform techniques have resulted in spectral decomposition with improved vertical resolution and more accurate frequency spectra. Some of these algorithms are matching pursuit of various kinds, the continuous wavelet transform, and various optimization methods. Spectral decomposition has been used successfully in both direct hydrocarbon indication and stratigraphic interpretation. The next major hurdle to overcome in the interpretation of spectrally decomposed data is separating fluid and stratigraphic effects. Experience has shown that integrated analysis of spectral decomposition with other attributes (such as AVO) combined with stratigraphic interpretations yields the best results. ■

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Biographical Sketch

Dr. John P. Castagna holds the Edward L. McCullough Chair in Geology and Geophysics and is director of the Institute for Exploration and Development Geosciences at the University of Oklahoma, where his main technical interest is quantitative seismic analysis in exploration and reservoir characterization. Dr. Castagna joined the University of Oklahoma in 1996. From 1980 to 1996 he worked for ARCO in a number of research, exploration, field-development, and management positions.

In 1995 Dr. Castagna was visiting research scientist at the Geotechnology Research Institute of the Houston Advanced Research Center, where he was principal investigator for research projects funded by the Gas Research Institute, the Energy Research Clearing House, and a consortium of energy companies. Also in 1995, he was named distinguished lecturer for the Society of Exploration Geophysicists (SEG), lecturing on "Applied AVO analysis: use and abuse of amplitude variation with offset." He has been chairman of the *Leading Edge* editorial board and first vice-president of the SEG. In addition to numerous technical papers, he is the author of the book *Offset-Dependent-Reflectivity: Theory and Practice of AVO Analysis.*

Dr. Castagna is a graduate of Brooklyn College, where he earned a bachelor of science degree in geology in 1976 and a master's degree in high-temperature geochemistry in 1981. He completed his doctoral degree in exploration geophysics at the University of Texas at Austin in 1983.