

# SIPES March Luncheon Meeting

## Selected Topics in Seismic Dispersion

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This presentation is a survey of selected frequency-dependent phenomena routinely encountered in reflection seismic data. At first impression the topic seems self-evident; everything is frequency dependent. However, much of classical seismology and wave theory is non-dispersive — the theory of P and S waves, Rayleigh waves in a half-space, geometric spreading, reflection and transmission coefficients, head waves, etc. The convolutional reflection models we use to model thick and thin bed thin response, as well as most inversion techniques, do not include dispersion phenomena. And yet when we look at real data, strong dispersion abounds.

The classical meaning of the word dispersion is frequency-dependent velocity. We take a more general definition that includes not just wave speed, but also interference, attenuation, anisotropy, reflection characteristics and other aspects of seismic waves that show frequency-dependence. We will examine the interpretive challenges presented by the reality of dispersion using modern, real data examples.

This presentation is a summary of Dr. Liner's 2012 SEG Distinguished Instructor Short Course, scheduled in Houston on April 20, 2012. ■

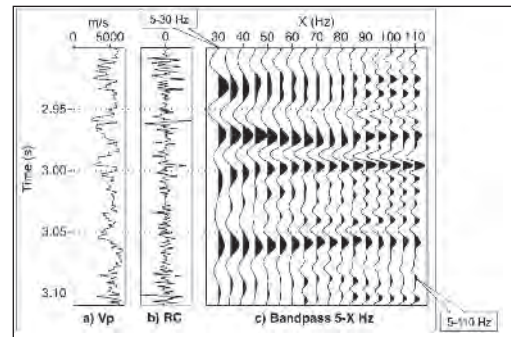


### Biographical Sketch

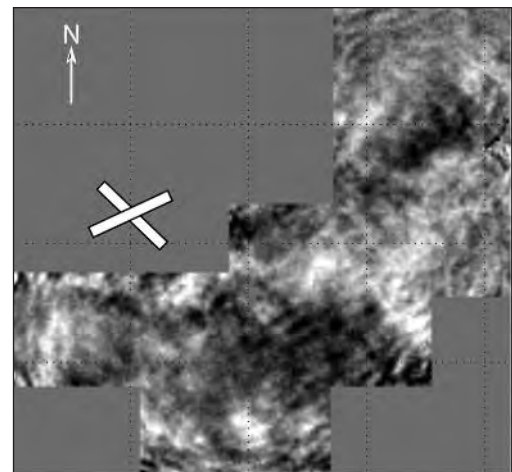
**CHRISTOPHER L. LINER** joined the faculty of the University of Houston Department of Earth and Atmospheric Sciences in January 2008 and is now professor and associate director of the Allied Geophysical Laboratories industrial consortium. He earned a Bachelor of Science degree in geology from the University of Arkansas in 1978, a Master of Science in geophysics from the University of Tulsa in 1980, and a Ph.D. in geophysics from the Center for Wave Phenomena at Colorado School of Mines in 1989. He began his career with Western Geophysical in London as a research geophysicist, followed by six years with Conoco.

After working a year with Golden Geophysical, he served as a faculty member of the University of Tulsa Department of Geosciences from 1990 to 2004. From 2005 through 2007, Dr. Liner worked as a research geophysicist with Saudi EXPEC Advanced Research Center, Dhahran, Saudi Arabia.

Dr. Liner's research interests include petroleum reservoir characterization and monitoring, CO<sub>2</sub>-sequestration geophysics, advanced seismic-interpretation methods, seismic data analysis and processing, near surface, anisotropy, and seismic wave propagation. He served as editor of *Geophysics* in 1999–2001, as a contributing editor to *World Oil* in 2010, and is an editorial board member for the *Journal of Seismic Exploration*. He has written many technical papers, abstracts for scientific meetings, the "Seismos" column in *The Leading Edge* since 1992, the "Seismos Blog," and the textbook, *Elements of 3D Seismology*, now in its second edition. He is a member of SEG, AAPG, AGU, the Seismological Society of America, and the European Academy of Sciences. In 2011, Dr. Liner was named an honorary member of the Geophysical Society of Houston.



Interference beyond the thin bed



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