Sergio Chávez-Pérez
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Semblanza

Sergio Chávez-Pérez was born in Mexico City in 1960. He received a B.S. degree in geophysical engineering from the National Autonomous University of Mexico (UNAM) in 1984 and an M.S. in exploration geophysics from the University of South Carolina in 1987. Chávez-Pérez began his work as an exploration seismologist in Mexico City at the *Instituto Mexicano del Petróleo* (IMP; Mexican Petroleum Institute) in 1987. In 1987–1992, he was research associate of engineering seismology at the Center for Seismic Research and adjunct professor of exploration seismology at UNAM. He went back to the United States in 1992 to pursue a Ph.D. in exploration seismology at the Seismological Laboratory of the University of Nevada–Reno in the Fulbright-CONACYT-IIE exchange program between Mexico and the United States (CONACYT stands for Mexico's National Council for Science and Technology, and IIE stands for the U. S. Institute of International Education). Chávez-Pérez obtained a Ph.D. in December 1997. Since January 1998, he has been a research geophysicist at IMP, following technology for IMP and PEMEX. He also has been an adjunct professor of exploration seismology at UNAM (1999–2014) and an adjunct professor at the University of Utah (2004–2014).

His areas of professional interest are seismic imaging (migration, modeling, tomography, and inversion); data processing and wavefield transformation; interpretation of seismic data for structural, stratigraphic, reservoir, and site-characterization targets; and seismic wave propagation (acoustic, elastic, and anisotropic). Chávez-Pérez became a member of SEG in 1981 during his undergraduate years in Mexico City. He was a candidate for SEG Vice President in 2007 and serves as associate editor of GEOPHYSICS for case histories and interpretation methods; a reviewer for Interpretation; a member of the Global Affairs, Latin American Advisory, Translations, and Research committees; an abstract reviewer, and a session and workshop organizer for SEG Annual Meetings. Chávez-Pérez is also a member of AAPG, AGU, AMGE, EAGE, and GSA.

Plenary Talk

Seismic bandwidth extension and resolution improvement: What works

From the standpoint of an exploration seismologist, one of the main topics of interest is seismic resolution. We all want to improve resolution by using techniques for bandwidth extension, and we tend to conclude that the apparent frequency enhancement leads to the desired resolution improvement. This lecture outlines examples of what works in current methods of frequency enhancement during acquisition, data conditioning, processing, reprocessing, advanced imaging, and postprocessing.

Standard validation of bandwidth-extension techniques is made through correlation with synthetic seismograms obtained from well-log data and tying to wells. This method is a common practice, but it is not good enough for inquiring minds because synthetic seismograms are based only on one-dimensional models and neglect the positioning and lateral changes that also need to be resolved.

I will argue that fast and easy ways of performing postprocessing frequency enhancement do not necessarily imply or much less guarantee resolution improvement. This argument is drawn from experiences with postprocessing frequency-enhancement tests that used onshore and offshore seismic data sets as well as canonical examples of analyzing simple tuning effects using synthetic seismograms.

The emphasis of the presentation is on oil and gas exploration seismology, but researchers, practitioners, and students in geology, petroleum engineering, near-surface geophysics, and earthquake seismology might also find the lecture useful.