

An Introduction to Rotational Seismology and Engineering Applications

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ABSTRACT

Although the effects of rotational motions due to large earthquakes have been observed for a few centuries (e.g., Oldham, 1899), seismology and related engineering applications have been based primarily on the observation and modeling of three-component translational ground motions. However, rotational motions from teleseismic and local earthquakes have been recorded directly by sensitive rotational sensors in the past decade, and deduced indirectly from linear-accelerometer arrays for even longer.

Realizing that rotational seismology and related engineering applications pose a frontier for deeper understanding of earthquakes and reducing seismic hazards, the United States Geological Survey is hosting the *First International Workshop on Rotational Seismology and Engineering Applications* in Menlo Park, California, on 18-19 September, 2007. Both seismological and engineering applications will be discussed in order to develop research plans and strategies for effective deployment of instruments to record rotational motions at free-field sites and in man-made structures.

This Workshop is one of the activities of the *International Working Group on Rotational Seismology* (IWGoRS), inaugurated during the 2006 Fall American Geophysical Union Meeting in San Francisco. At that meeting, a special session on *Rotational Motions in Seismology* was convened by H. Igel, W.H.K. Lee, and M. Todorovska. This working group aims to promote investigations of rotational motions and their implications and to share experience, data, software, and results in an open, web-based environment. Please visit: <http://www.rotational-seismology.org/> for more information about this Working Group.

Special attention is directed to publication formats for the 2007 Workshop to expedite the open and wide sharing of both mature and preliminary research results. All Workshop talks and posters are documented by abstracts to be printed in the Workshop Program Booklet, and by computer files in this USGS Open-File Report (on a DVD). Both will be distributed to the participants on the first day of the Workshop.

The website for this Workshop is at: <http://pubs.usgs.gov/of/2007/1144/>, where the Online Proceedings of the First International Workshop on Rotational Seismology showcases the advances being made in rotational motions: theoretical investigations, direct and indirect measurements in both the far field and near field, and the implications of these rotational motions to geophysics, strong-motion seismology, and earthquake engineering.