

グローバルCOE地球惑星科学 特別講義



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所属 : カリフォルニア工科大学
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場所 : AOB 別館 第一会議室
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Spectral Characteristics of Great Earthquakes

講義内容 :

The recent progress in ultra-long period seismology and availability of high-quality broad-band records have enabled us to construct the source spectrum of great earthquakes over a wide frequency band from 0.001 to 1 Hz. The spectral shape is determined by several factors such as the seismic moment, fault dimension, stress drop, and the slip speed which is controlled by the fault-zone frictional properties. The large mega-thrust earthquakes, outer-rise earthquakes (both normal and thrust fault earthquakes), and tsunami earthquakes all have distinct characteristics. Several relevant issues will be discussed: (1) Tsunami earthquakes are known to be deficient in high-frequency energy, but several different mechanisms seem to be responsible for the deficiency. (2) Although the spectrum of the 2011 Tohoku-Oki earthquake appears “normal”, it is a result of cancellation of two effects, high stress drop and slow slip speed. (3) Outer-rise earthquakes, especially those with thrust mechanism, are enriched at periods shorter than 20 sec, and have important implications for long-period ground motions. (4) Some earthquakes, e.g., the 2009 Samoa earthquake, exhibit anomalous long-period spectrum suggesting a very complex rupture pattern.

In view of the observed diversity of great earthquake spectra, a use of the entire spectrum, rather than just the magnitude alone, for quantitative hazard assessment of great earthquakes is strongly recommended.

主催 : 東北大学 グローバルCOEプログラム
『変動地球惑星学の統合教育研究拠点』
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