【情報提供】＋

# 地球自由振動からみた 東北地方太平洋沖地震 -スマトラ地震との比較として-

*presented by H. Kawakatsu*

## Earth's Free Oscillations Excited by the 26 December 2004 Sumatra-Andaman Earthquake

Jeffrey Park,[1] Teh-Ru Alex Song,[2] Jeroen Tromp,[2] Emile Okal,[3] Seth Stein,[3] Genevieve Roult,[4] Eric Clevede,[4] Gabi Laske,[5] Hiroo Kanamori,[2] Peter Davis,[5] Jon Berger,[5] Carla Braitenberg,[6] Michel Van Camp,[7] Xiang'e Lei,[8] Heping Sun,[8] Houze Xu,[8] Severine Rosat[9]

At periods greater than 1000 seconds, Earth's seismic free oscillations have anomalously large amplitude when referenced to the Harvard Centroid Moment Tensor fault mechanism, which is estimated from 300- to 500-second surface waves. By using more realistic rupture models on a steeper fault derived from seismic body and surface waves, we approximated free oscillation amplitudes with a seismic moment ($6.5 \times 10^{22}$ Newton·meters) that corresponds to a moment magnitude of 9.15. With a rupture duration of 600 seconds, the fault-rupture models represent seismic observations adequately but underpredict geodetic displacements that argue for slow fault motion beneath the Nicobar and Andaman islands.

*(Science 2005)*

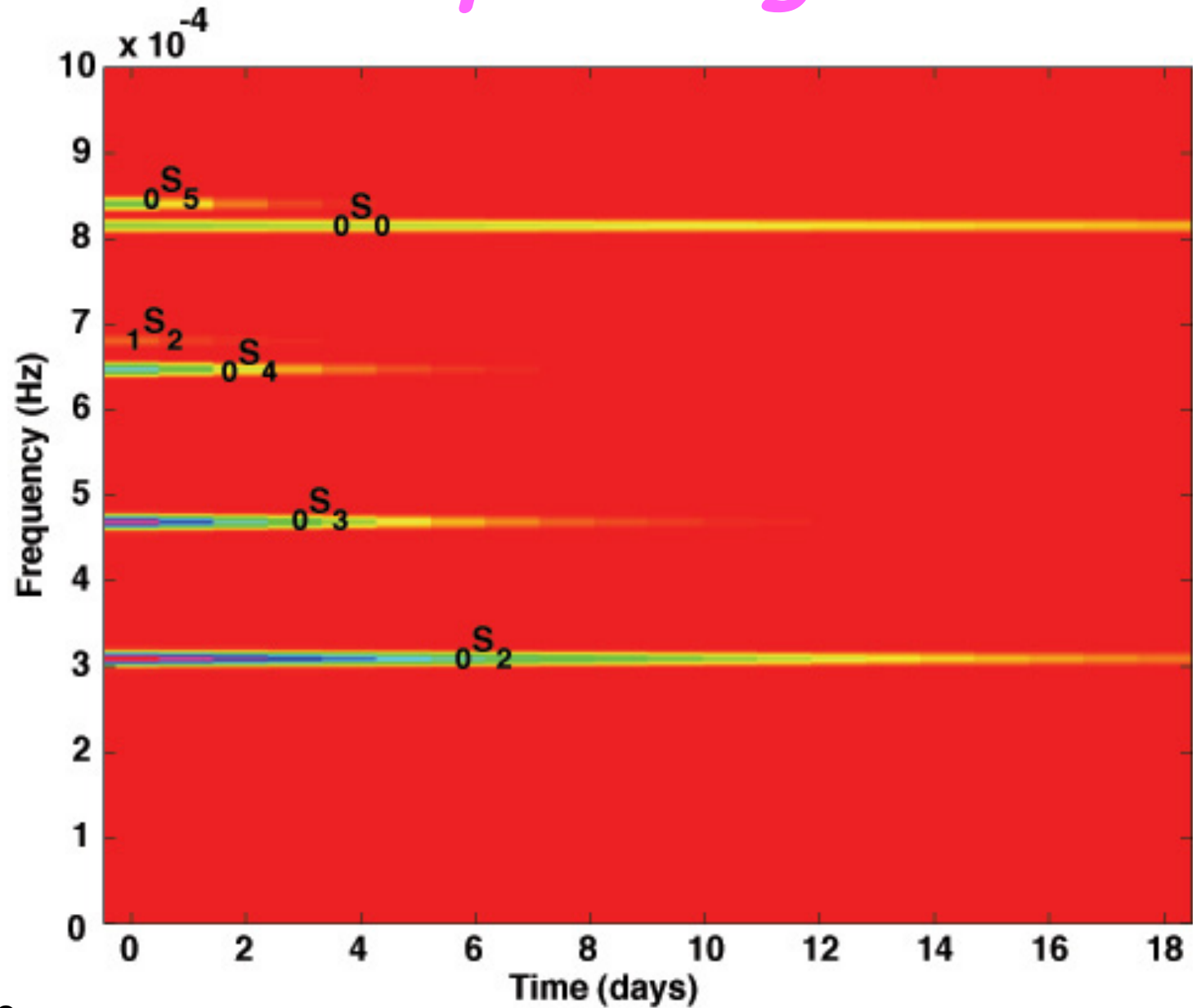courtesy of Alex Song (IFREE/JAMSTEC; ERI visiting scholar ("GaiRai Kenkyu-in"))
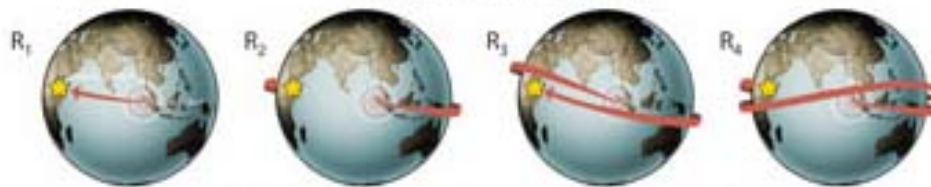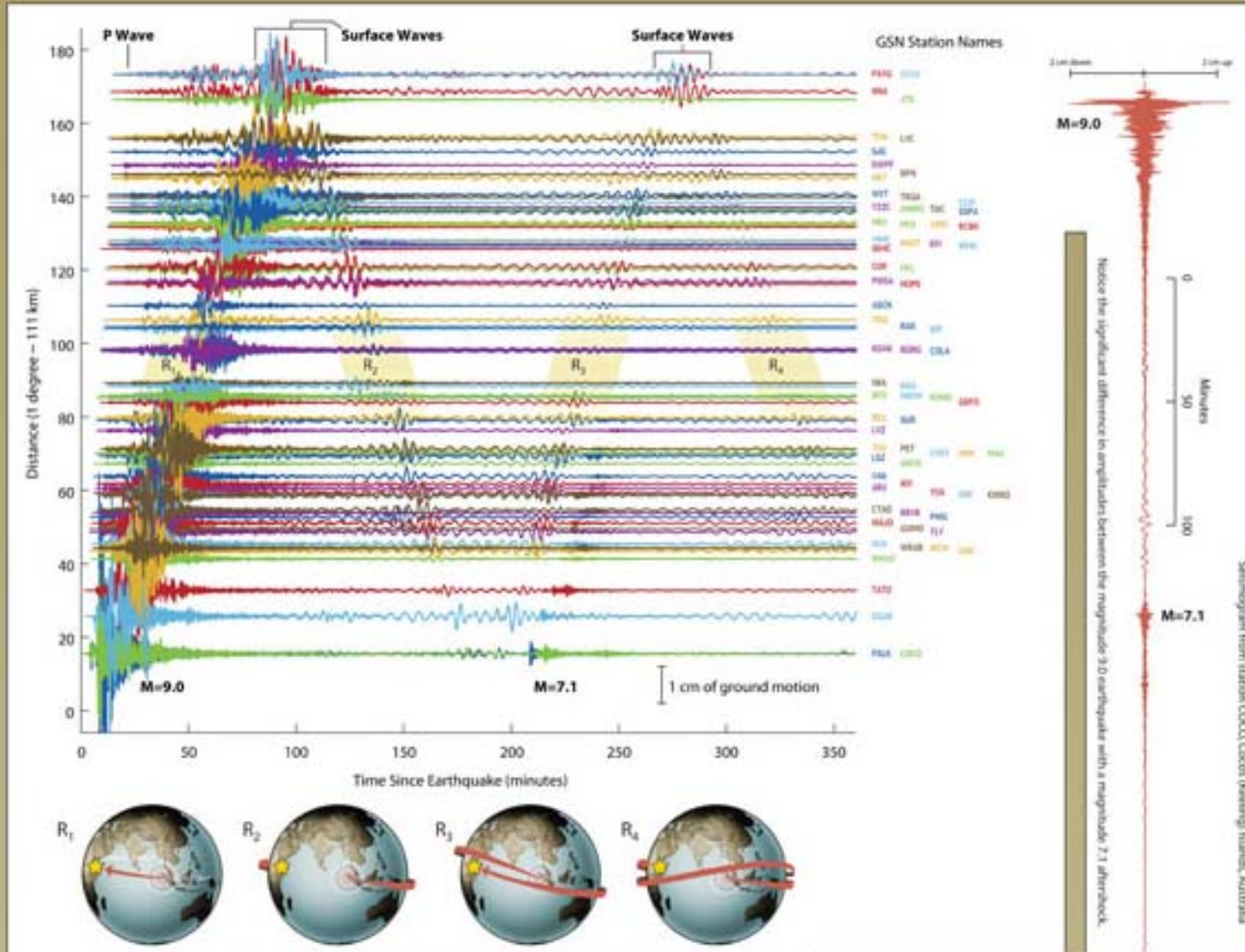
from IRIS web site

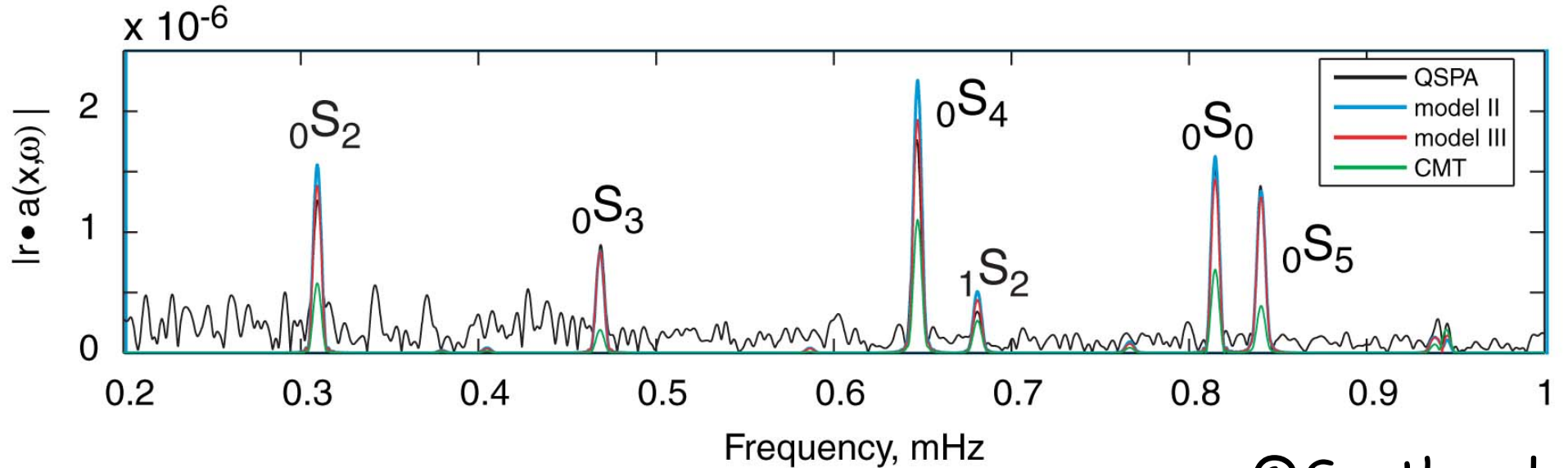# Earth's free oscillation: Sumatra
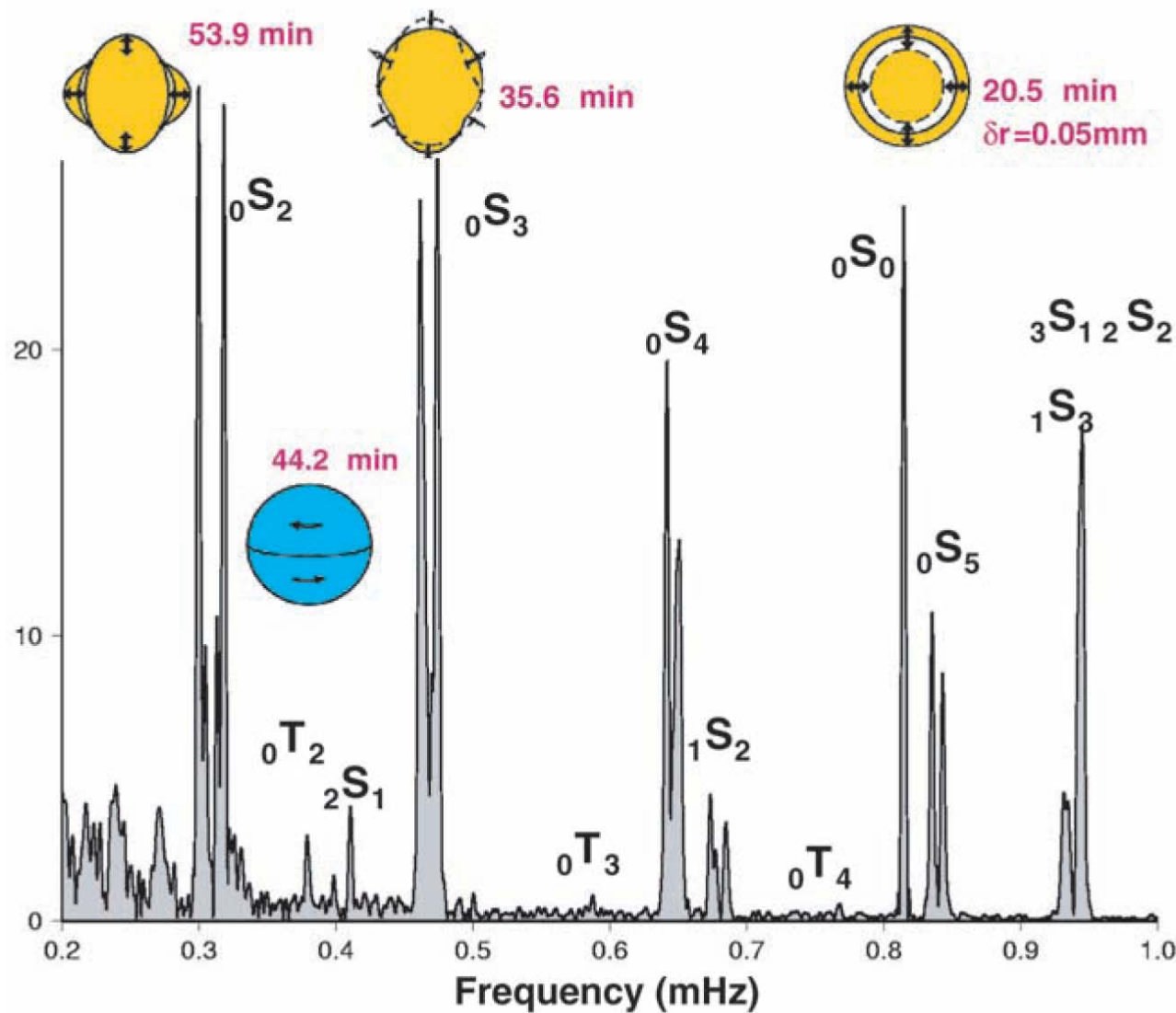


Park, Song et al. (2005, Science)
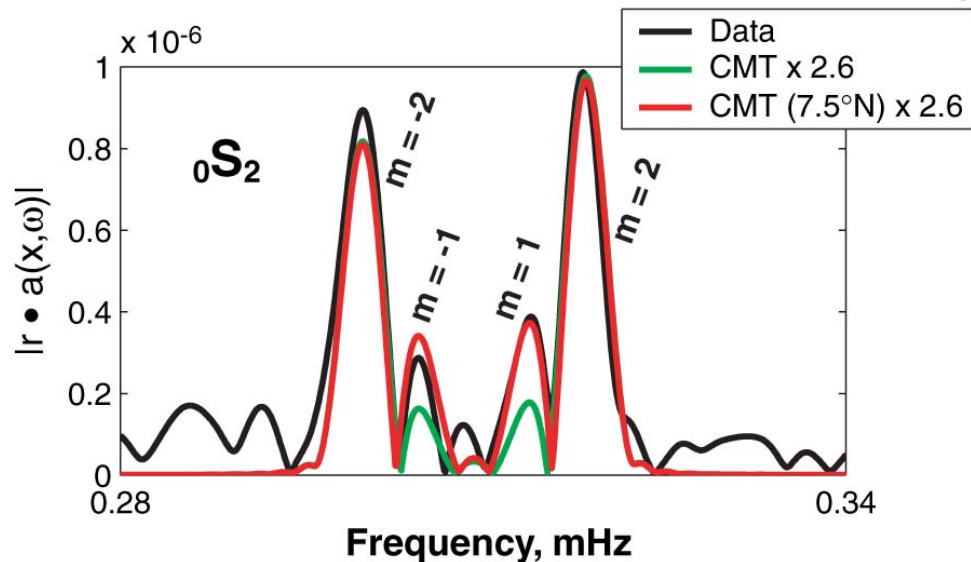
# *Sumatra spectrogram*
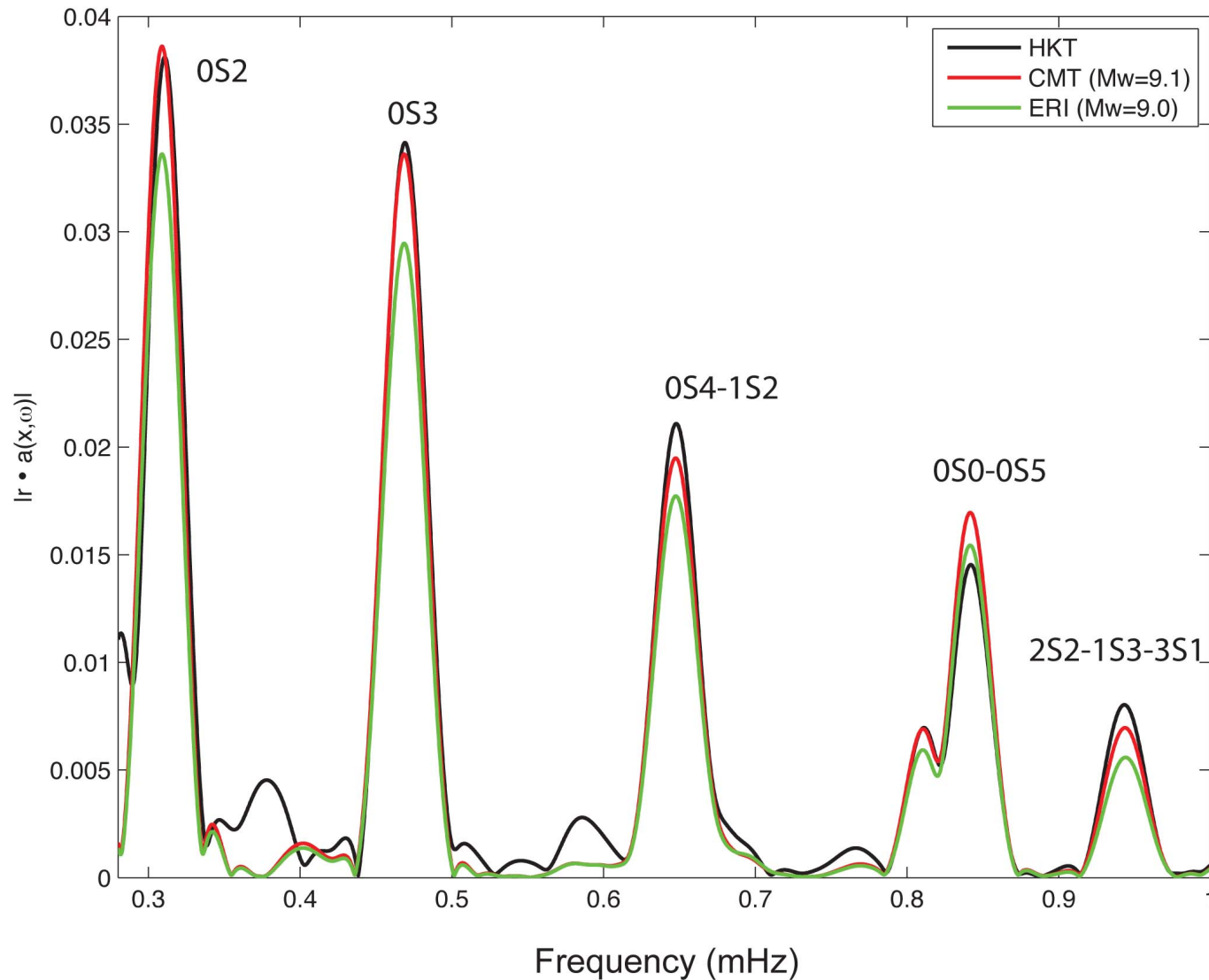


from IRIS web site

# Earth's free oscillation: Sumatra



@South pole

*Park, Song et al. (2005, Science)*
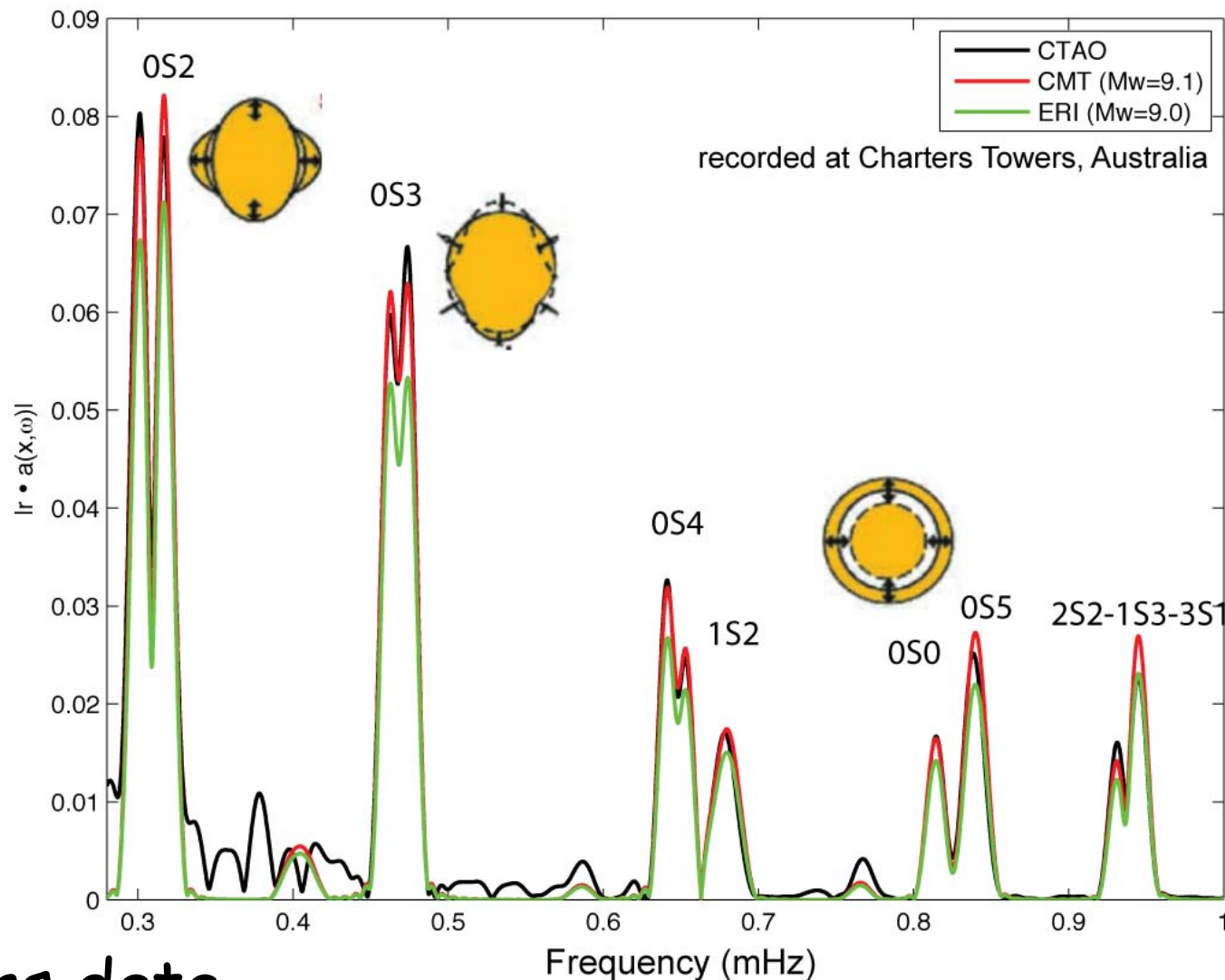
# Earth's free oscillation: Tohoku



20hours data

*Song (personal com.@3/14 0:15)*
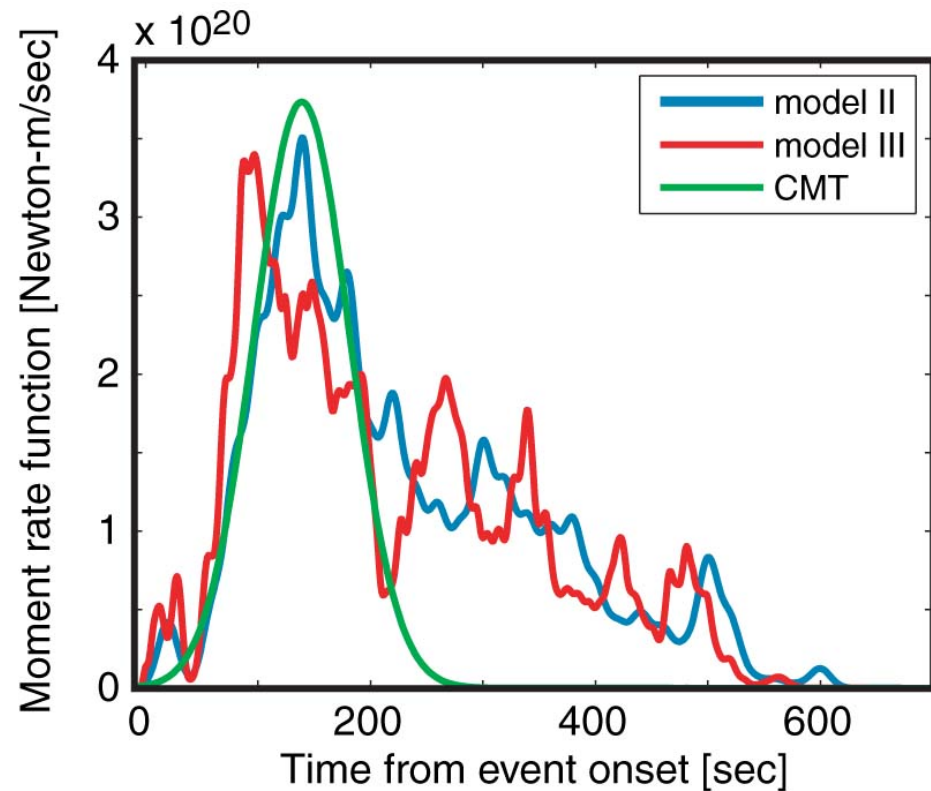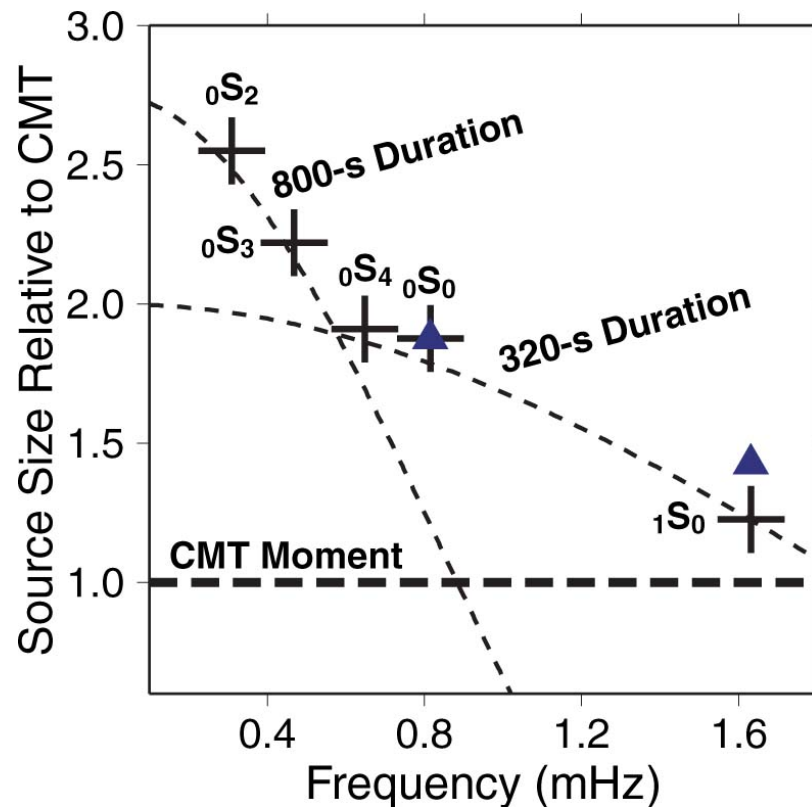
# Earth's free oscillation: Tohoku



Earth's Free Oscillations excited by the 2011 Tohoku earthquake

40hours data

*Song (personal com.@3/14 13:15)*

# Source duration: Sumatra



*Park, Song et al. (2005, Science)*

# Summary

| | Global CMT (300-500s) | Mode (1000-3500sec) |
|---|---|---|
| Sumatra 2004 | 2.5x10**22 (Nm) Mw = 8.87 | 6.5x10**22 Mw >= 9.15 |
| Tohoku 2011 | 5.31x10**22 Mw=9.08 | comparable Mw = 9.0-9.1 |