Seismogram Patterns

Notes, Questions, etc.

For many years, individuals in a number of cultures such as China, Japan, and Italy developed tools to monitor earthquakes. Late in the nineteenth century, the Jesuits deployed seismographs in the Philippines. In the 1880's workable seismographs were used by Japanese and British scientists at the Imperial College of Engineering in Tokyo, Japan. In 1897, John Milne, from the Imperial College, convinced the British Association for the Advancement of Science to establish a global seismographic network, which two years later included 27 stations and at least one station operating on each continent. The Jesuit network eventually grew to 37 stations on six continents, most were deployed before 1920. These early decades of instrumental observation were filled with excitement and major advances in our understanding of Earth's structure.

In a way, you are starting a course of study similar to that which the first modern seismologists began in the early 1900's.

This exercise is designed to present to you the initial challenge that they confronted and to introduce you to the scientific adventure that they began when they studied the early seismograms. As you start this course, you face the same challenge and begin the same adventure.
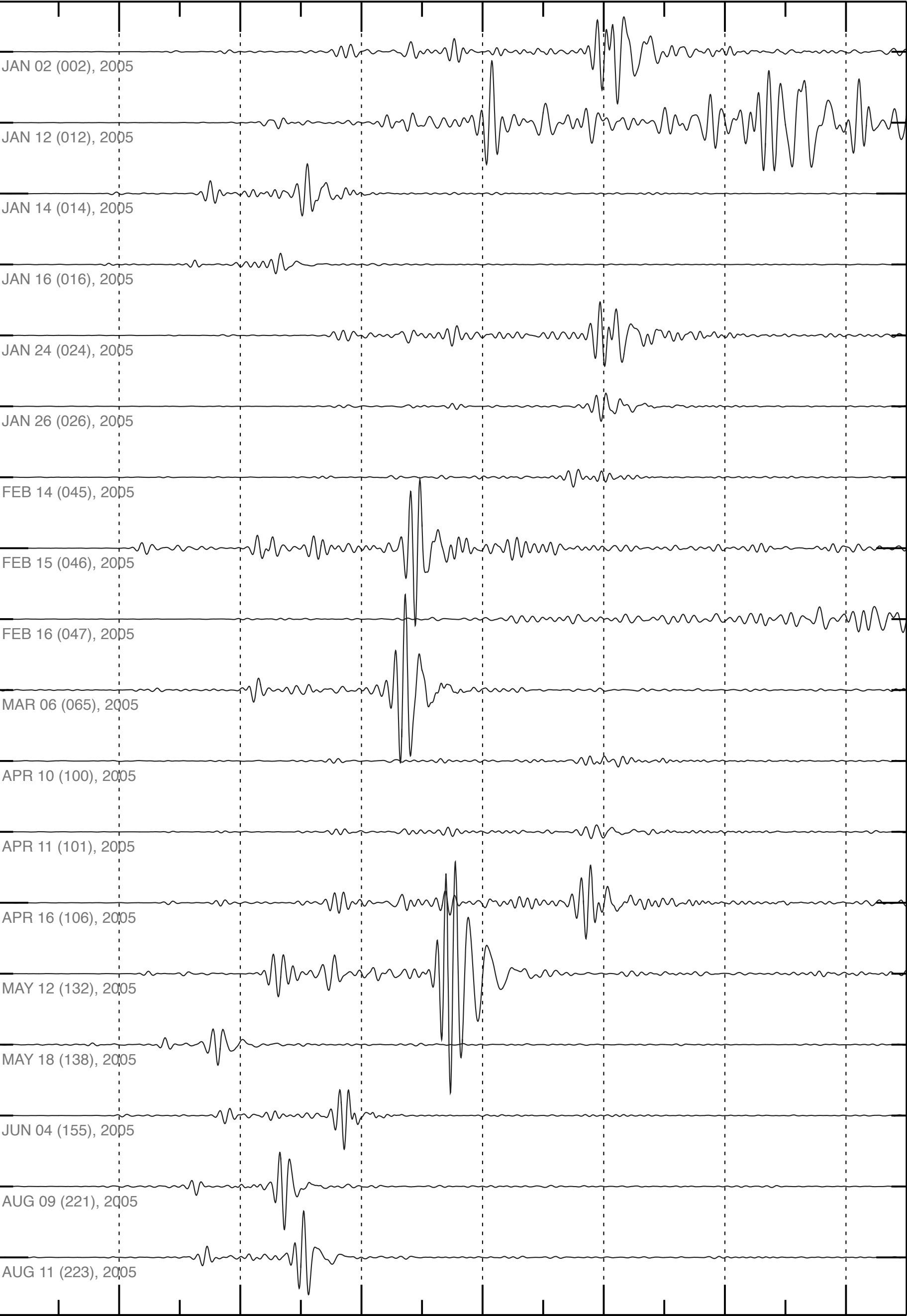
The chart opposite this page contains 18 seismograms recorded since the beginning of 2005. The date for each "record" is shown just below the seismogram on the left. For convenience, I have arranged the plot so that the starting time of each seismogram is equal that of the event that produced the disturbances. These seismograms are a record of the vertical ground motion on the Big Island of Hawaii during the indicated times. When a curve moves upward, the ground moved upward, when a curve moves downward, that indicates that the ground moved downward. All observations are plotted on the same scale.

Carefully study these observations. Identify what you consider to be their fundamental characteristics. Think freely and creatively. Look for patterns. Compose a list of questions regarding the nature and cause of the features that you identify in the disturbances. Construct a list of topics that you think that we might need to know in order to unravel and to understand these observations.

The time that you invest studying and thinking about these data will yield rewards later when study the physical basis behind the phenomena that produce such ground motions.

Station KIP, Kipapa, Hawaii, USA / 21.4233N -158.015E 70m

JAN 02 (002), 2005

JAN 12 (012), 2005

JAN 14 (014), 2005

JAN 16 (016), 2005

JAN 24 (024), 2005

JAN 26 (026), 2005

FEB 14 (045), 2005

FEB 15 (046), 2005

FEB 16 (047), 2005

MAR 06 (065), 2005

APR 10 (100), 2005

APR 11 (101), 2005

APR 16 (106), 2005

MAY 12 (132), 2005

MAY 18 (138), 2005

JUN 04 (155), 2005

AUG 09 (221), 2005

AUG 11 (223), 2005

0   600   1200   1800   2400   3000   3600   4200

Time (Seconds) After "Disturbance"