

Focal Mechanism

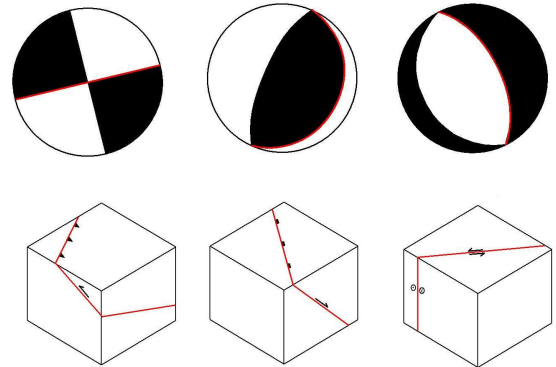
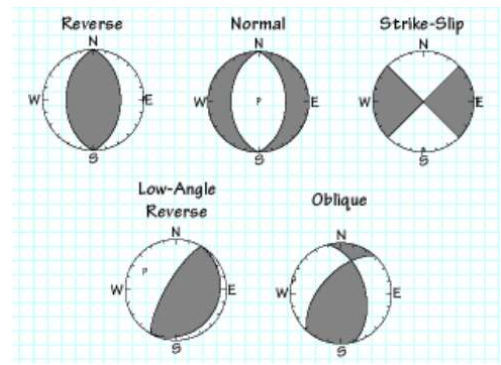
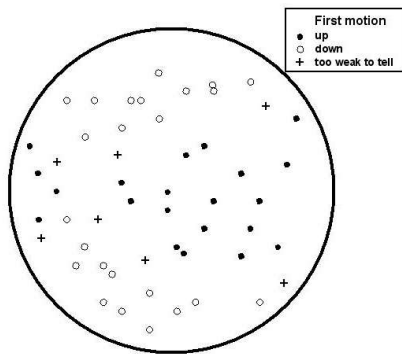
This describes the sense of motion that occurs on the fault during an earthquake.

It is depicted in a “beachball” diagram that shows how first motion direction is felt on the far side of the earth from the earthquake.

They also allow us to determine the type of fault on which the earthquake occurred.

1) Match up the three beachball diagrams to the right with the correct fault diagram.

2) The diagram below represents the first motion felt at a number of seismograph stations scattered across the globe on the far side of a major earthquake. Use the data represented to determine the variety of beachball diagram and the type of earthquake.

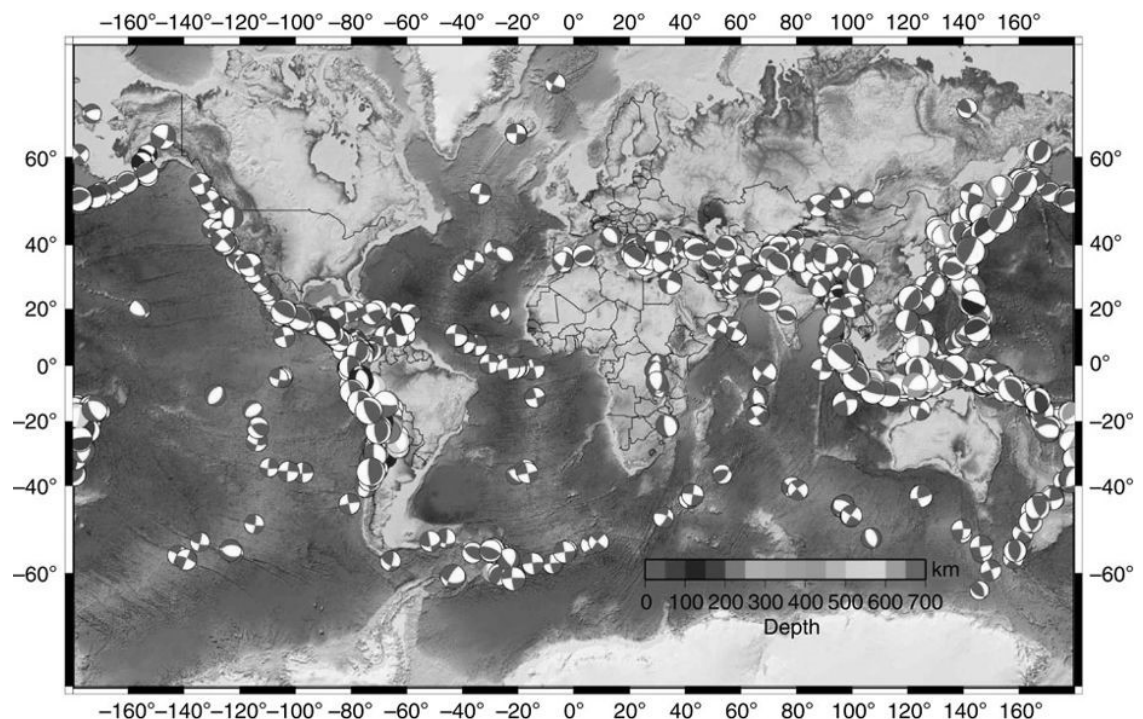


3) Identify where normal, reverse, and strike slip faults occur of the world seismic map below.

a) One geologic setting in which strike-slip faults dominate.

b) One locality where reverse faults dominate.

c) One locality where normal faults dominate.

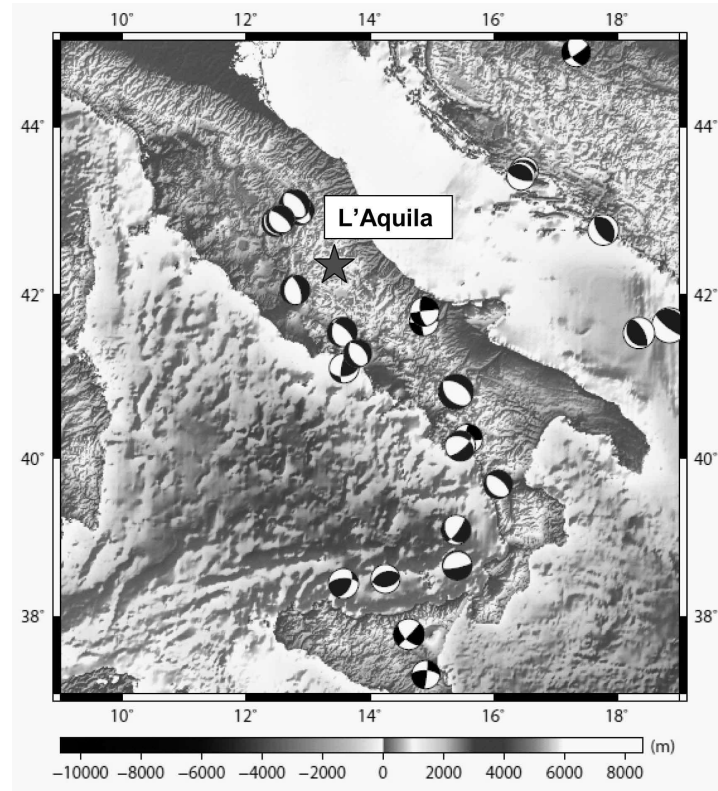


Earthquake Stress Environment

On the 6th April 2009 a magnitude 6.3 earthquake struck L'Aquila, the capital city of the Abruzzo region, central Italy (figure to the right). The earthquake killed around 300 people and made tens of thousands of people homeless.

The Apennine peninsula has a long history of earthquake activity (far older than the human species). Some of the more significant seismic events are shown as focal mechanism (beach-ball) diagrams to the right.

- 4) What form of stress is the apennine peninsula experiencing, based on the beach-ball diagrams?
- 5) What form of stress is occurring on the other side of the Adriatic Sea (to the northwest)?
- 6) Explain how these two stresses might be related.
- 7) Are there any zones of strike-slip stress in this region?
- 8) What is happening to the island of Sicily (bottom centre), based on the earthquakes shown?



- 9) The diagram to the right shows the earthquake beach-ball diagrams for many of the recent earthquakes in the India/Tibet region. Based on this data, show the regions of different stress environments (compression, tension, shear) on the map below. Explain how these different stress regimes might be caused by plate tectonic movement.

