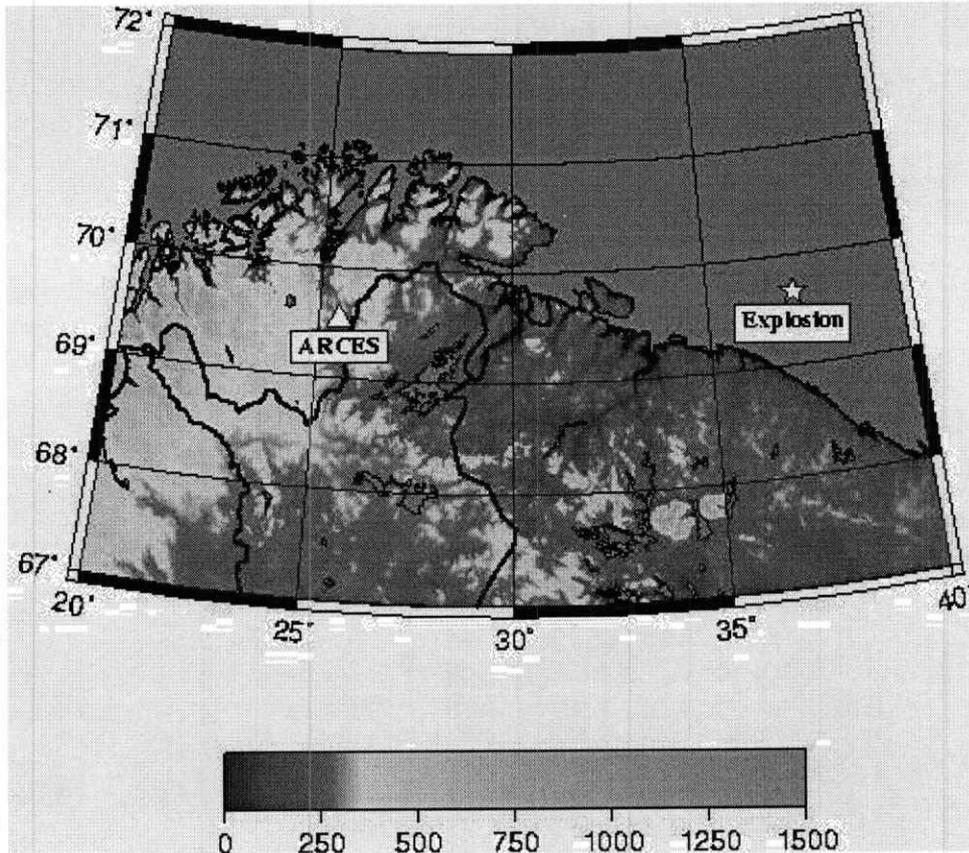
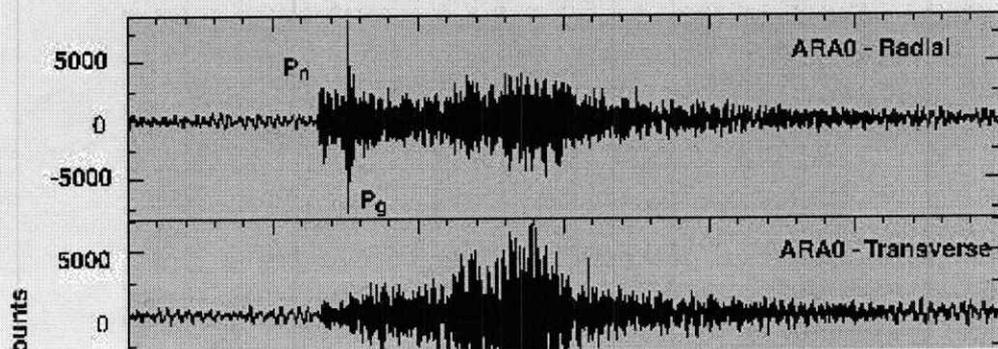


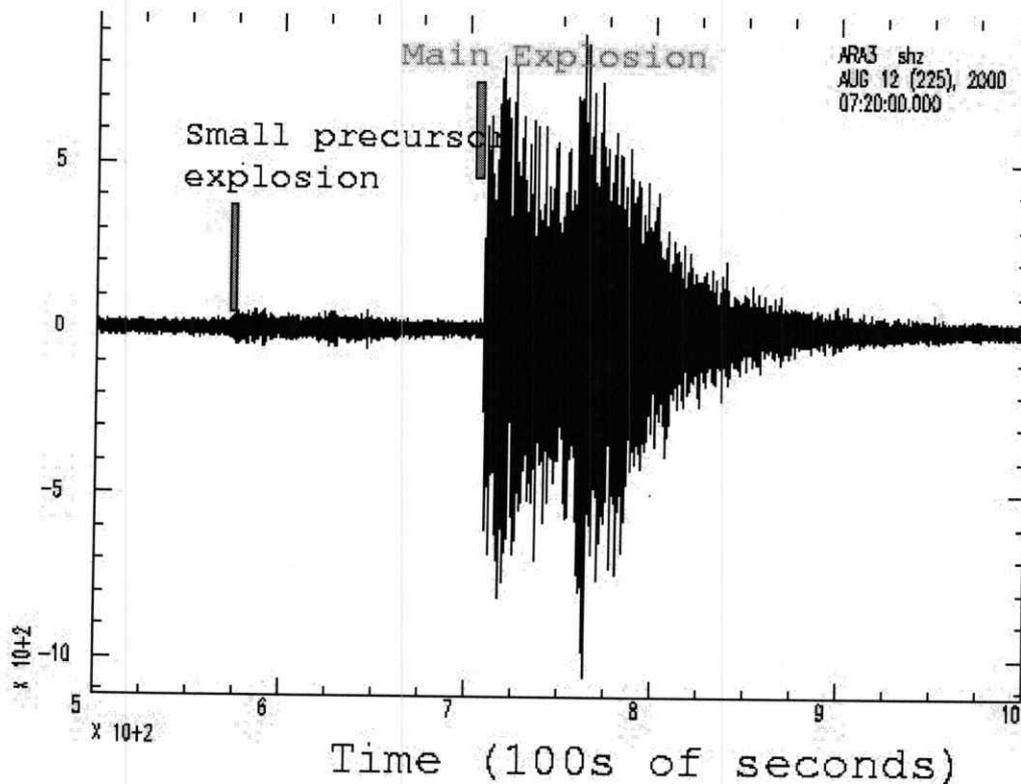
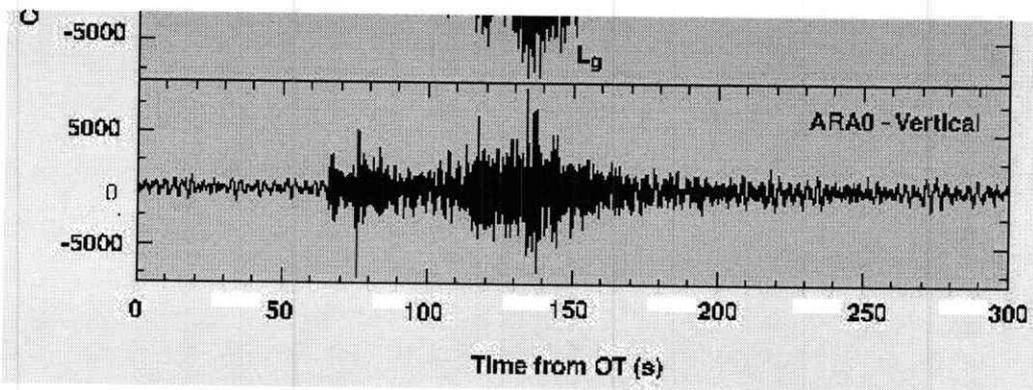
The Russian submarine Kursk sunk north of the Kola Peninsula on Saturday, August 12. The sinking was associated with two explosions separated by approximately 2 minutes. The second explosion was much larger, and was recorded on seismometers up to 4500 km away. The map to the right shows the location of the explosion (the presumed site of the Kursk today) and one of the closest seismic stations. Seismic recordings at ARCESS from the second, larger explosion. The three components correspond to the three directions of ground motion. Although the explosion was a impulsive



Russian Submarine Explosion From a Seismometer Located 450 km Away

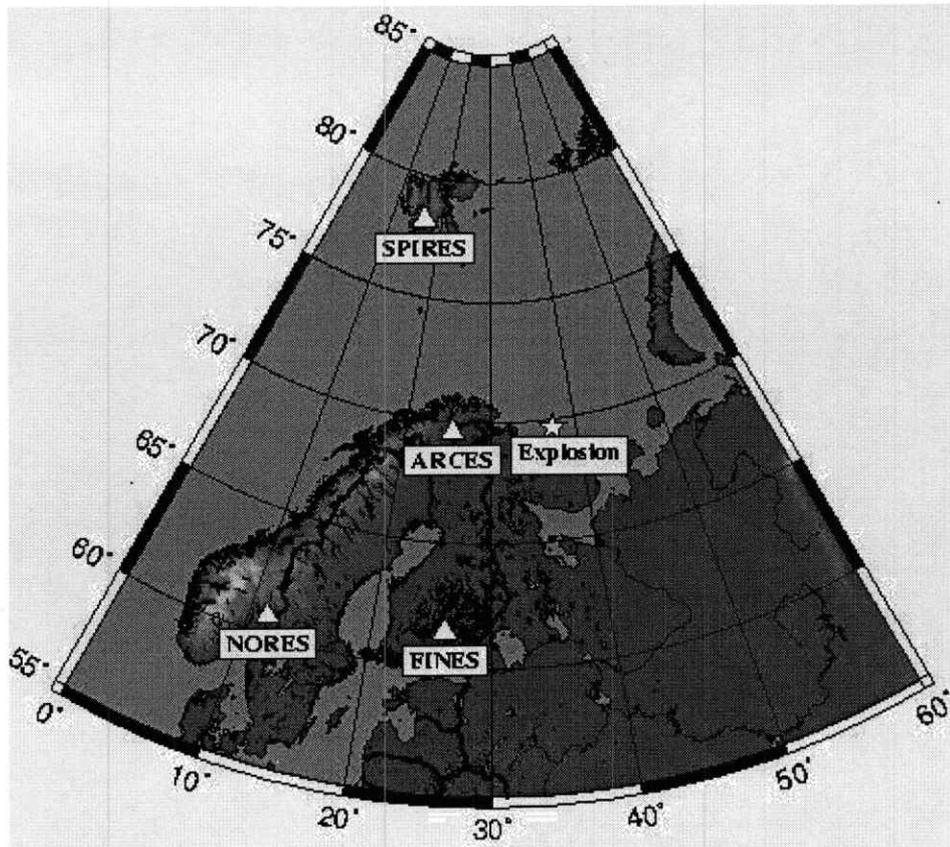


event the seismograms are complex due to the propagation of the seismic waves through the earth. The first arriving seismic phase is Pn followed by Pg.

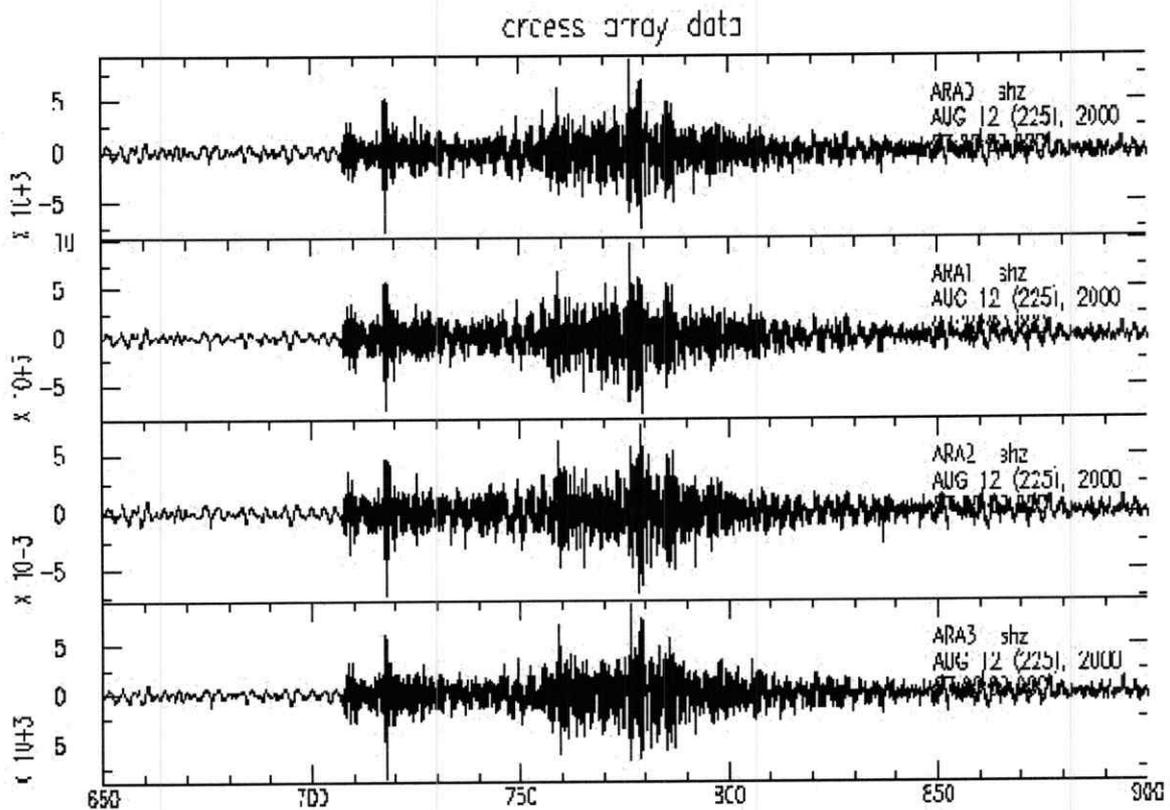


This is a long time window that shows the two explosions. The first explosion is at least one order of magnitude smaller than the second explosion.

Seismic Analysis



The size of the explosion can be estimated by calculating a magnitude at a number of stations. The map below shows the locations of some of these stations.



Seismograms for the larger of the two explosions. Magnitude for the array data is 3.43

The yield relationship for explosions in water recorded on land is complex. However, an average relation is

$$M = 3.5 + 0.75 * \text{Log (Yield)}$$

Using this relationship, the explosion on the Kursk was approximately .25 to .75 tons

(relationship is from Khalturin, Rautian and Richards, BSSA, 1998, pg 1521)

Preliminary Analysis!

Questions: Terry Wallace (wallace@geo.arizona.edu) or Dr. Keith Koper (kkoper@geo.arizona.edu)