

**PEPP 2003 Written Project**

**By**

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# Earthquake Location Laboratory

## Objective:

1. The student will learn how to use basic functions on WinQuake.
2. The student will recognize p-waves and s-waves from a digital seismogram.
3. The student will interpret digital seismograms for travel time difference.
4. Student will read data to give epicentral distance and find latitude and longitude for an event.

## Supplies:

1. WinQuake program installed on several computers or available in the computer lab
2. Teleseismic earthquake files on floppy disks from different stations (at least 5 stations)
3. Earthquake location data sheet
4. Bookmark containing WinQuake manual (for reference if needed)

## Procedure:

1. Obtain a disk containing 5 files of an unknown teleseismic event from the teacher.
2. Open a file from the diskette in WinQuake.
3. Locate the first p-wave on the seismogram and mark it. The location can be pinpointed by zooming in on that portion of the seismogram.

4. Locate the larger s-waves on the same seismogram and mark the point of first arrival. The location can be pinpointed by zooming in on that portion of the seismogram.
5. On the earthquake location data table, on line 1, record the station name (from the file name), the p-wave arrival time, the s-wave arrival time, distance from epicenter, and earthquake origin time. These values can be found at the top of the seismogram window.
6. Repeat steps 2-5 four times for the remaining files.
7. When the p and s waves have been identified on each of the 5 seismograms, the epicentral location can be found by clicking view and move to locate.
8. Record the latitude and longitude coordinates from your data on the earthquake location data table.
9. From a list of choices found on the chalkboard, determine which earthquake you have just analyzed. Write this name on the earthquake location data table along with your disk number.

## Teacher Preparation:

1. Request 4 relatively recent, teleseismic earthquakes from the IRIS website (<http://www.iris.edu/cgi-bin/wilberII>). Make sure there are at least 5 stations reporting the same event (PN and IU networks). Also make sure the files are in .sac file format (sac binary individual format).
2. Store the data files of each event on a separate floppy disk. Each disk should contain 5 files of the same event, but from different stations. When saving the files to the floppy disk, save them as the station name, not the event location!
3. Make enough copies of the disks so each student can have his/her own disk.
4. Make a key of which earthquake is on each disk in order to evaluate student choices. For example, Disks 1-6 contain “event 1”, Disks 7-12 contain “event 2”, disks 13-18 contain “event 3”, and disks 19-24 contain “event 4”.
5. List all of the event locations along with the latitude and longitude coordinates to allow students to identify their unknown events.
6. Reference materials may include, Introducing WinQuake handout and WinQuake manuals online.
7. Inform students to set winquake for a teleseismic event. (At the Tables menu on winquake, choose “teleseismic”)

Name(s) \_\_\_\_\_

Block \_\_\_\_\_

### Earthquake Location Data Table

Station Name	P-Time	S-Time	Distance from Epicenter	Origin Time

Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

Estimated Location Name: \_\_\_\_\_