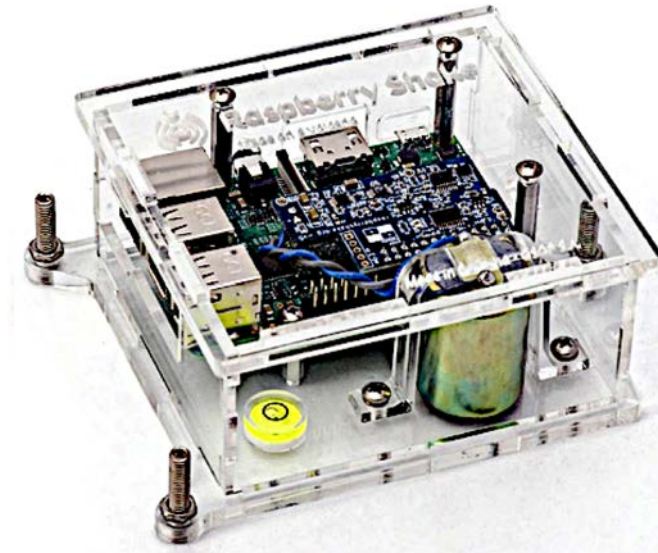


THE INTRIGUING VARIETY OF THINGS WE RECORD WITH OUR RASPBERRY SHAKES:

CITIZEN SCIENTISTS, EDUCATORS, AND RESEARCH SCIENTISTS COLLABORATING TO MONITOR OUR ACTIVE PLANET

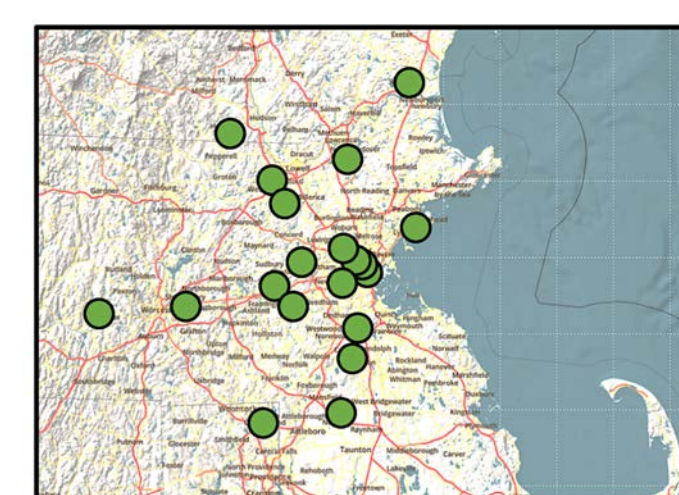
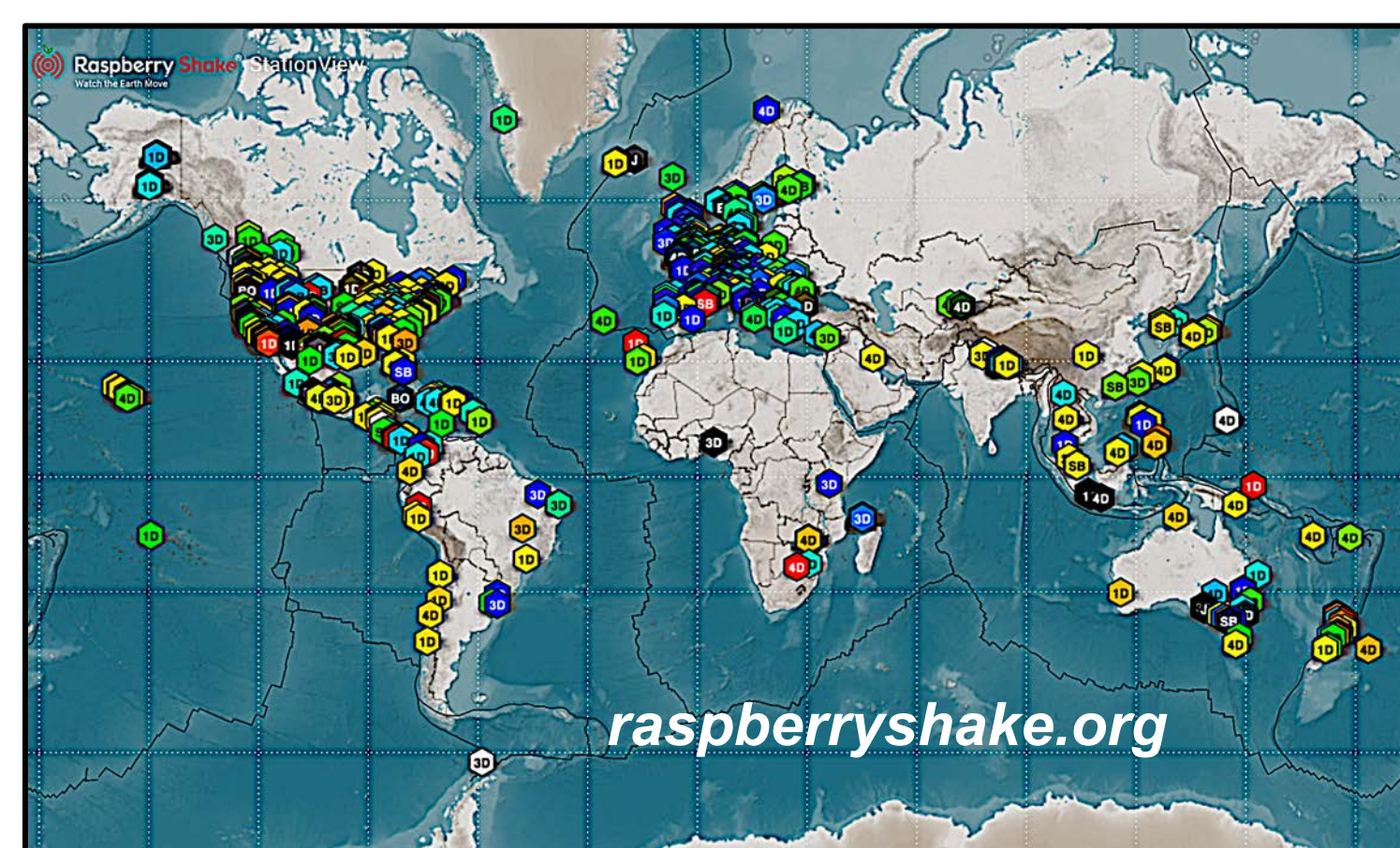
A.L. Kafka (Weston Observatory, Earth and Environmental Sciences, Boston College), J.J. Pulli (Raytheon BBN Technologies), K.R. Fink (Texas Educational Seismic Project), C. Stapels (MathWorks), K. Cannon (Weston Observatory, Earth and Environmental Sciences, Boston College), D. McCasland (Blue Hill Observatory Science Center), K. McLaughlin (Leidos Dynetics-LInC), J.N. Kafka (WeirdHat.com), R. Block (Snow Star Farm), and M. Sharkey (Boston College).

When we first (four years ago) became aware of the availability of the low-cost *Raspberry Shake* (RS) seismograph, we were intrigued about how well it would record earthquakes; intrigued enough to buy some of them and see what they might record. As each of us installed and ran our RSs (and Raspberry "Booms" for infrasound), we formed this group of professional and citizen seismologists (within the larger, global RS community) working together to discern what these small, affordable RSs might record. The results were surprising and intriguing. We discovered that there was more interesting seismology recorded by these \$400 instruments than we imagined possible. Three surprises, in particular, were: 1. Yes, these little high-frequency geophones, integrated with some clever software on a Raspberry Pi computer, do record long-enough period signals for recording earthquakes, 2. Signal coherence between nearby stations allows for advanced signal processing, and 3. These RSs record a lot of other interesting seismic events, such as storms, snow plows, wind turbines, street traffic, aircraft, construction sites, thunder, washing machines, and more.

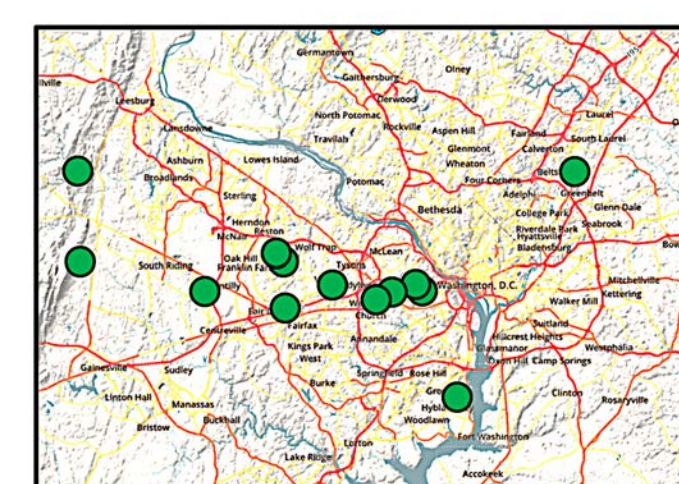


Here we show some of the many seismic events we have recorded on our RSs. Many more examples are on various social media platforms, research publications by many scientists, meeting posters and presentations, blogs, and online newsletters. See, for example, twitter.com/Weston_Quakes and twitter.com/KristiFinkTXESP, where we are able to efficiently reach a wide and diverse audience, bring science to people, and people to science. We found that RSs are surprisingly good for recording local and regional earthquakes and also record some large, distant earthquakes better than we expected. Plus, we are intrigued by the many other types of seismic sources recorded by our RSs that we are just beginning to explore. This experience highlights opportunities for citizen scientists, educators, and research scientists collaborating to monitor our active planet.

Raspberry Shake Stations

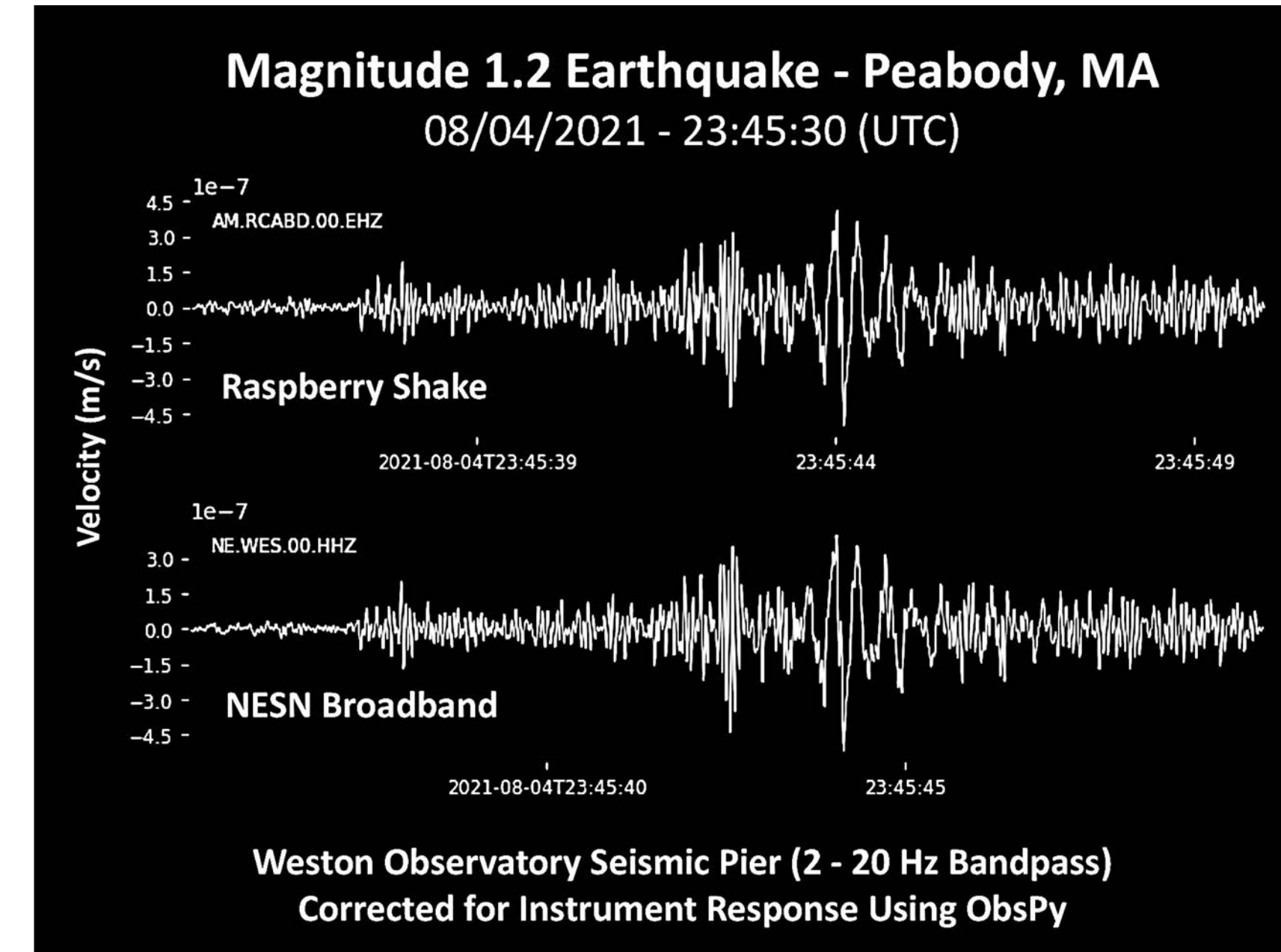
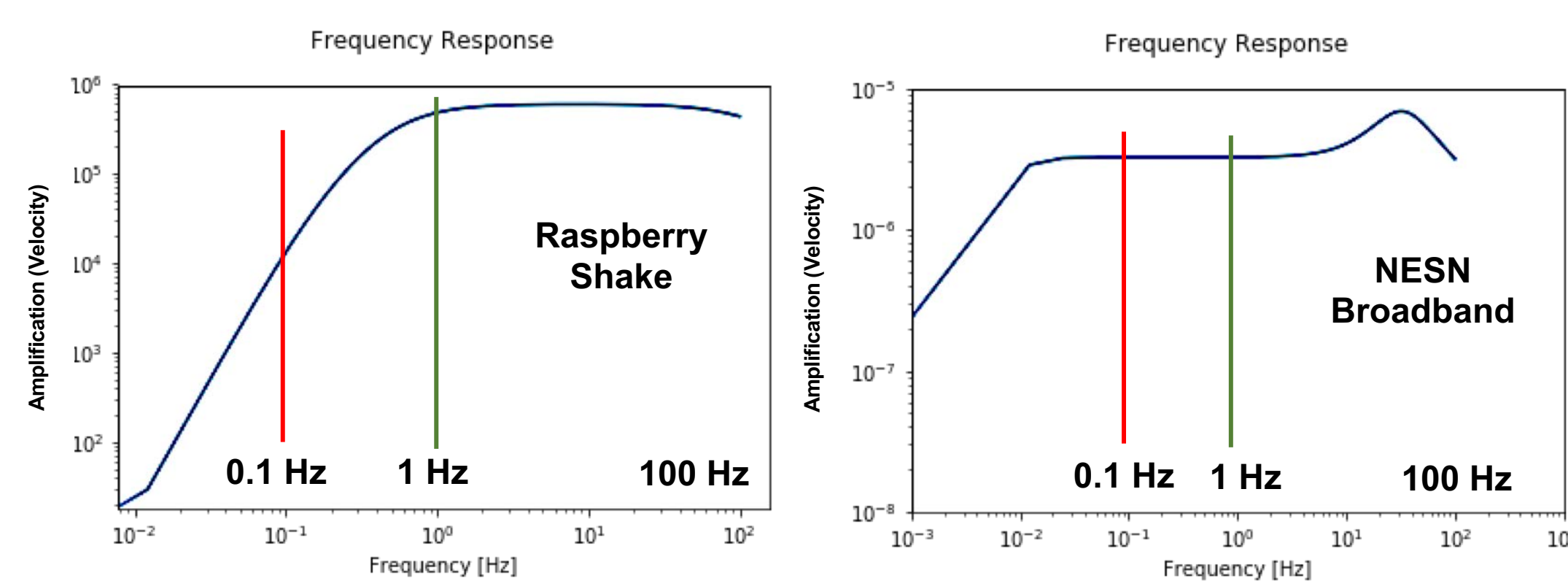


Boston Area Stations

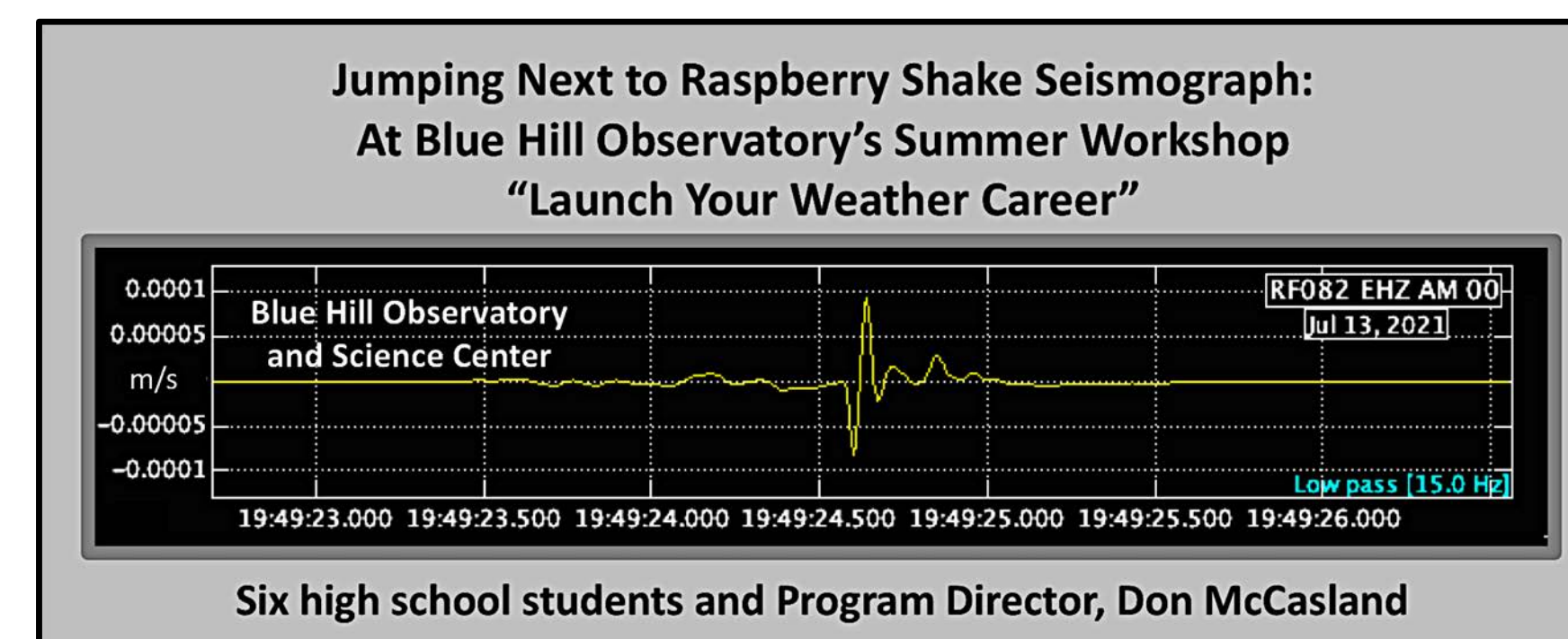


DC Area Stations

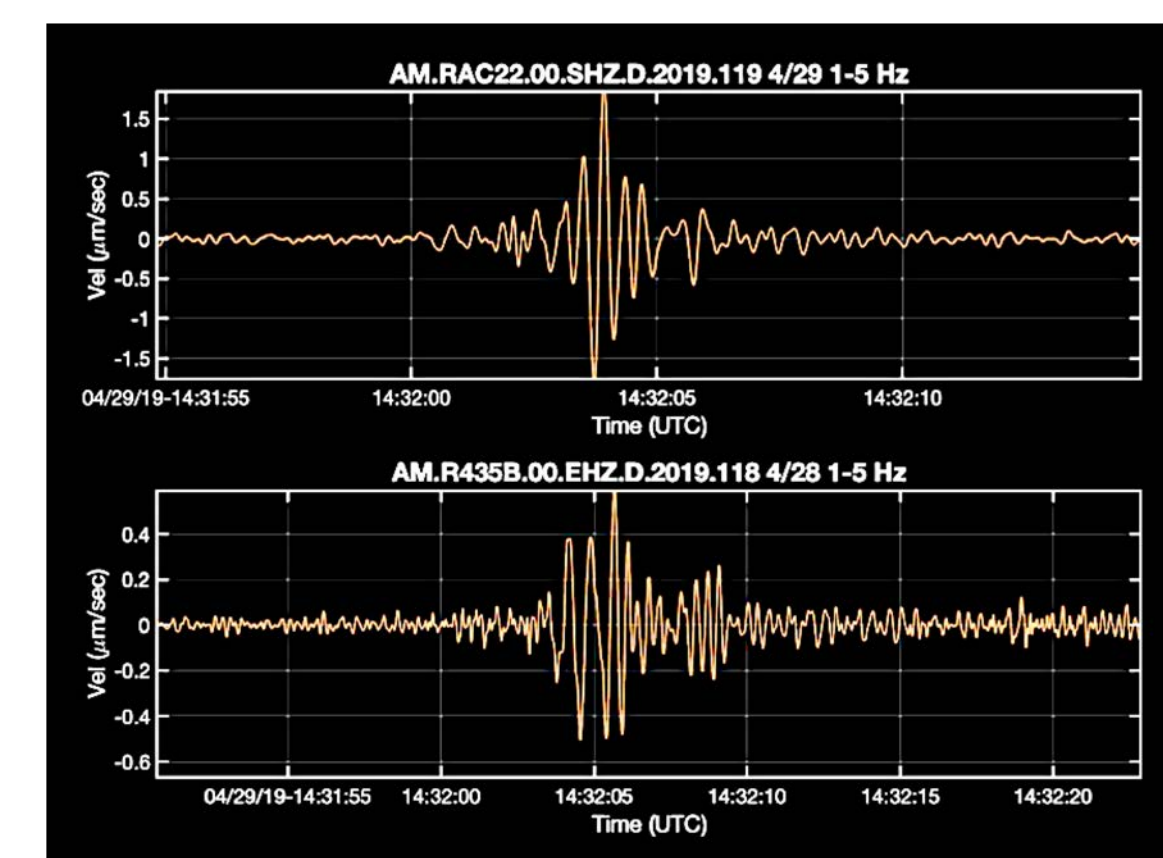
Instrument Response



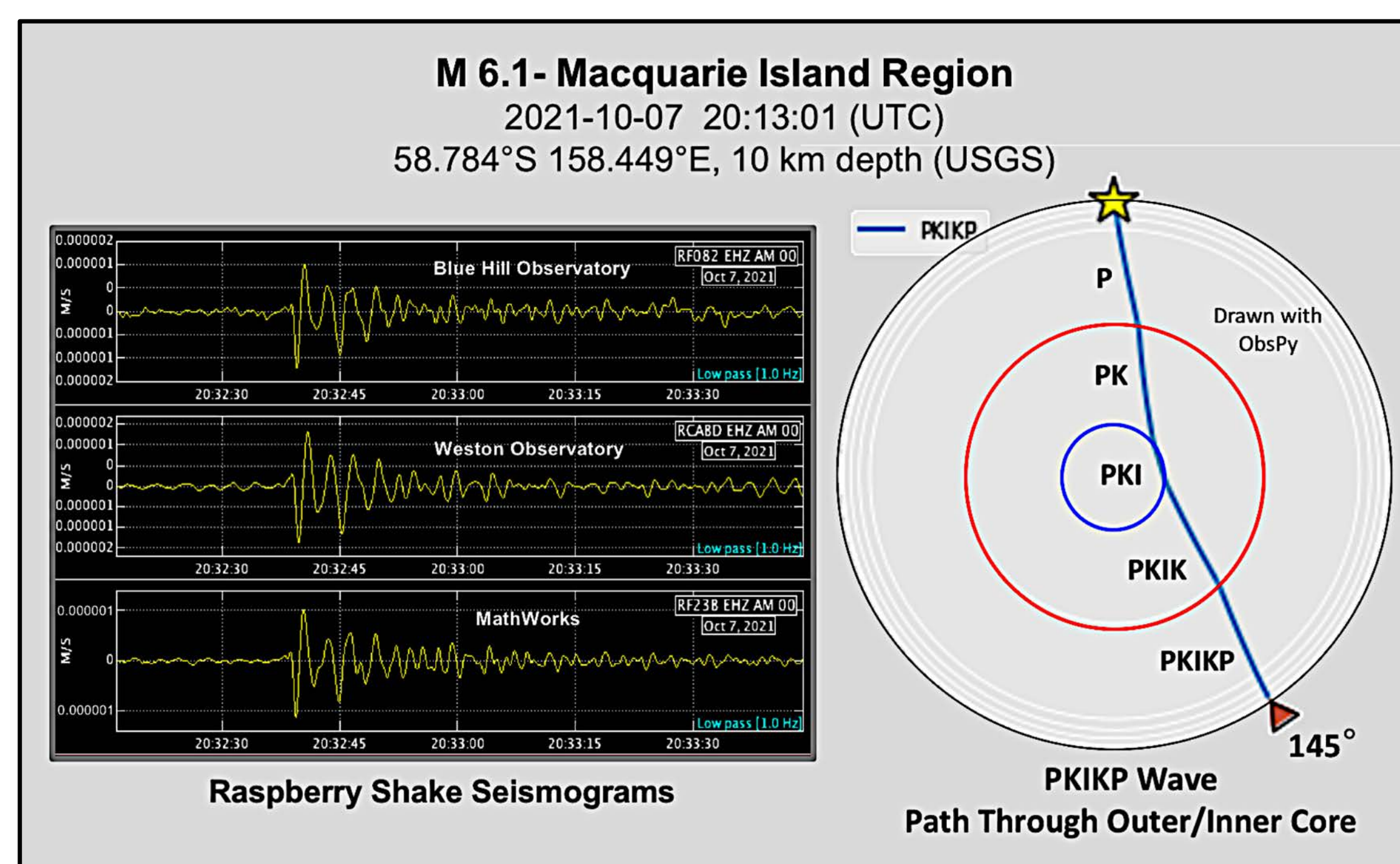
Magnitude 1.2 – Peabody, MA



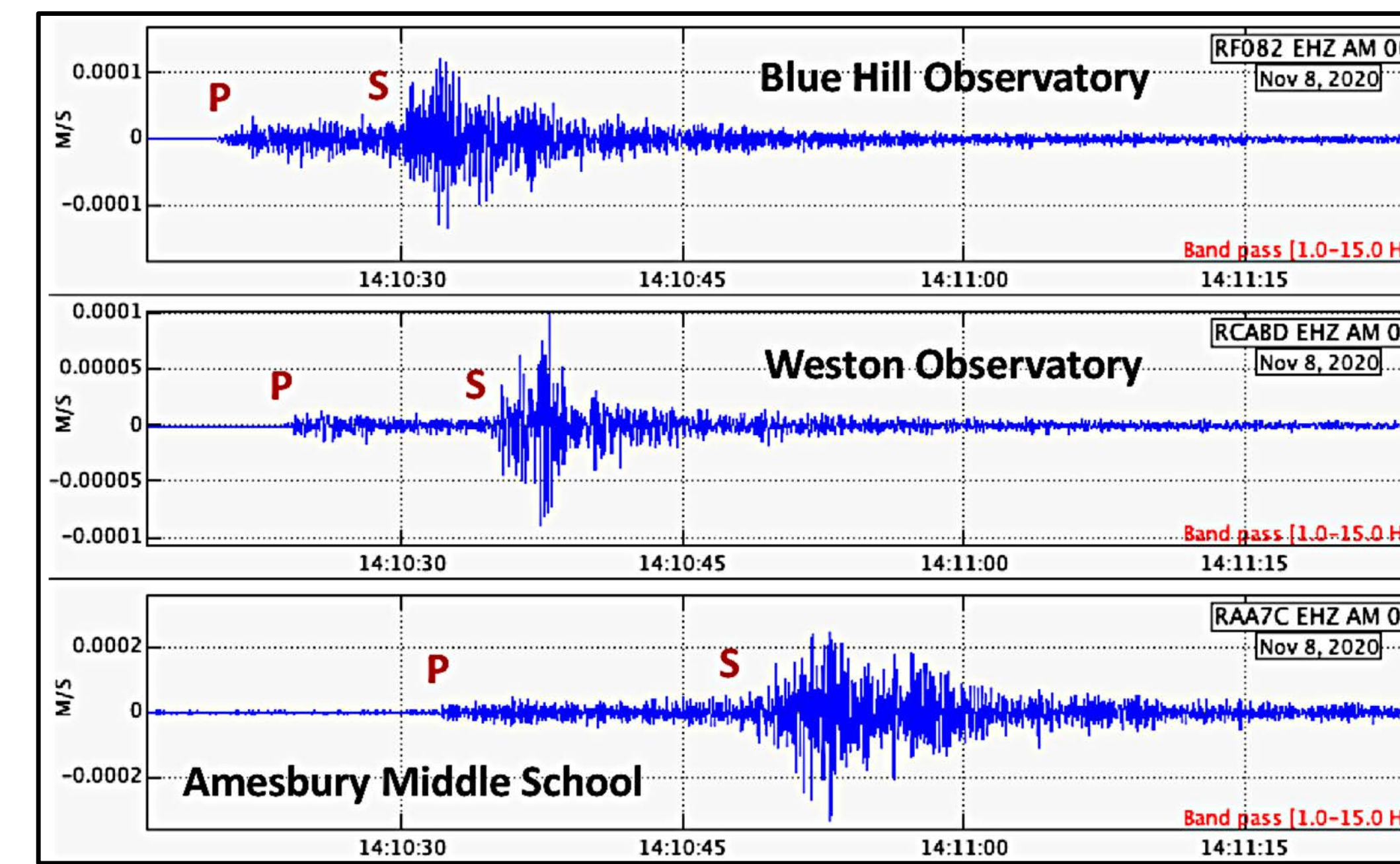
Six students jumping...



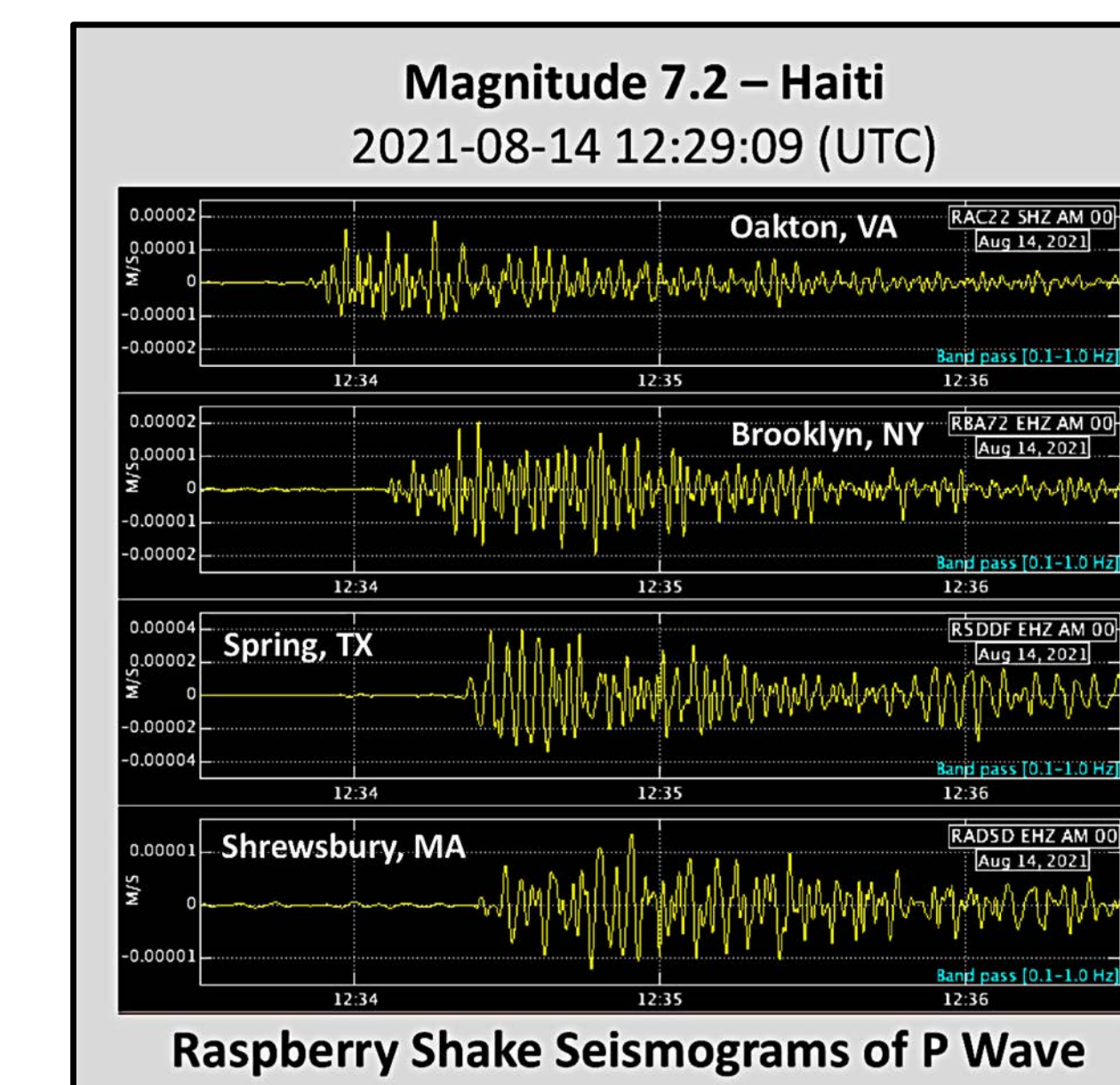
Quarry Blast Near Dulles Airport



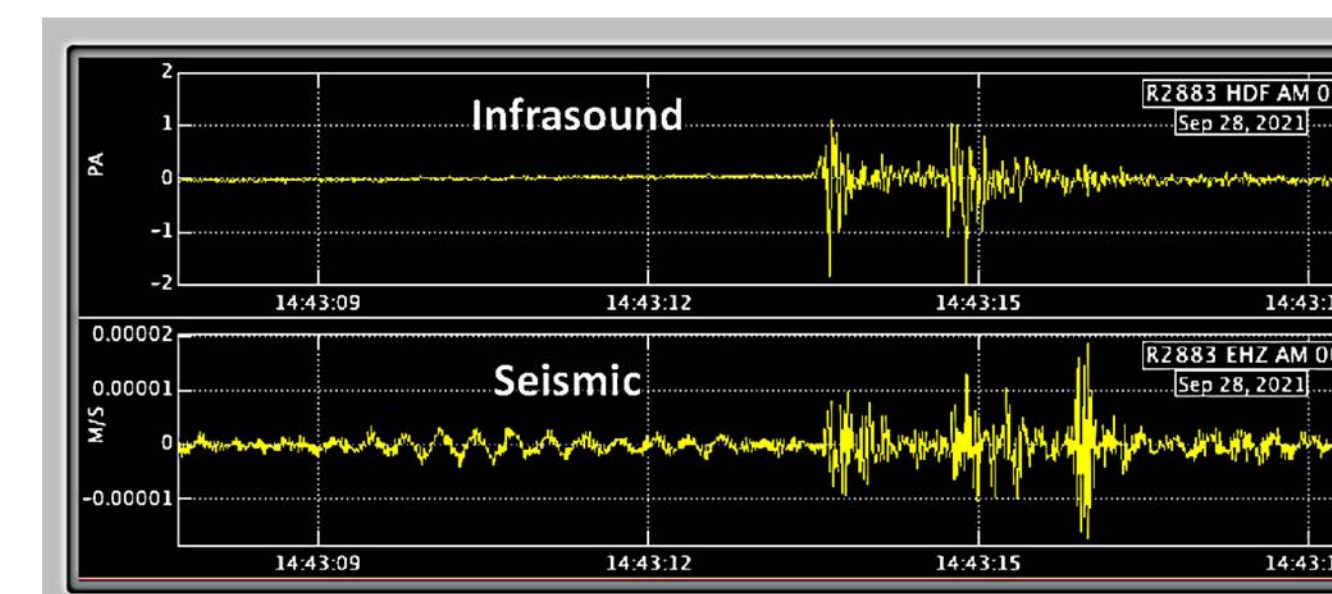
Magnitude 6.1 – Macquarie Island Region



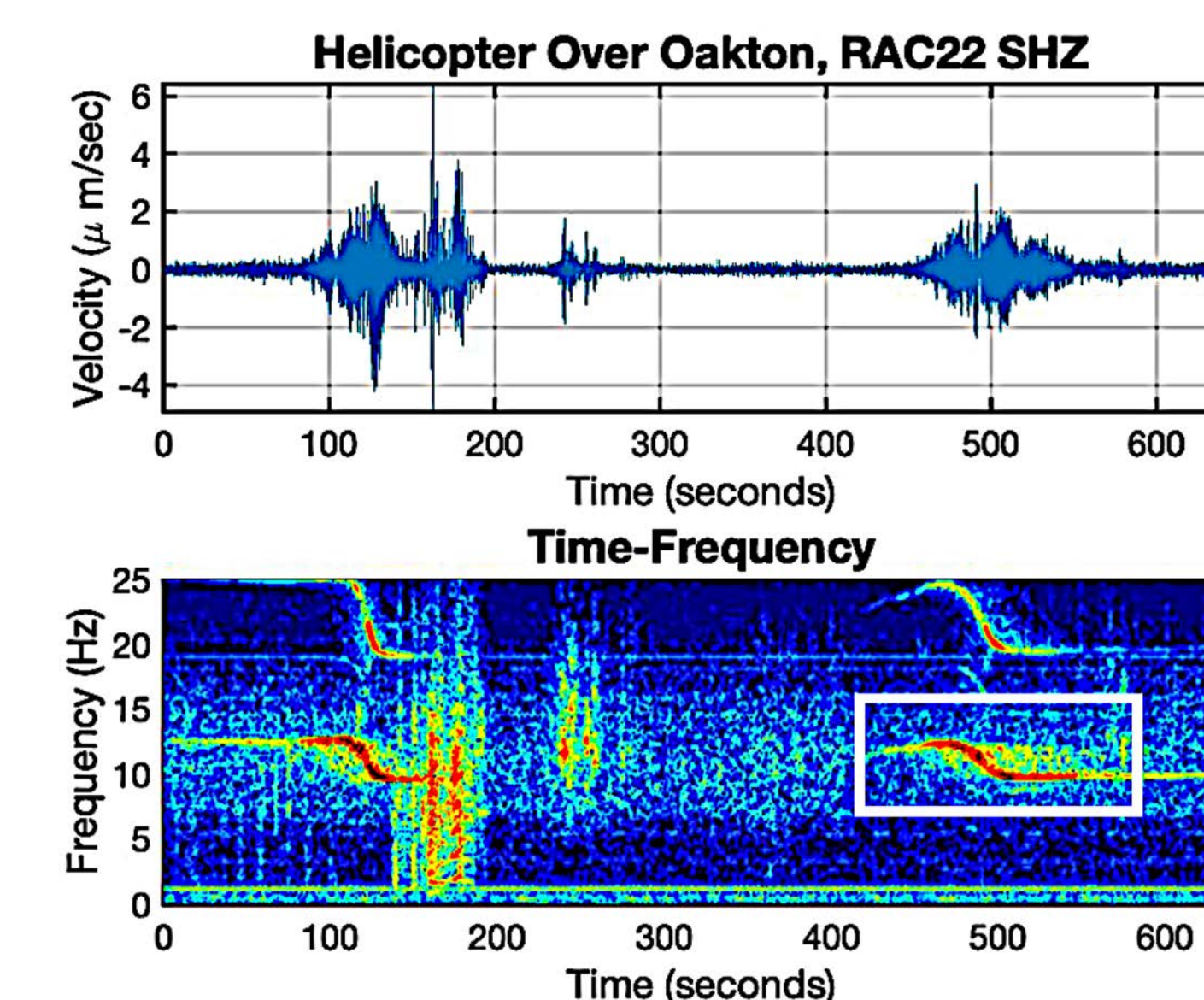
Magnitude 3.6 – New Bedford, MA



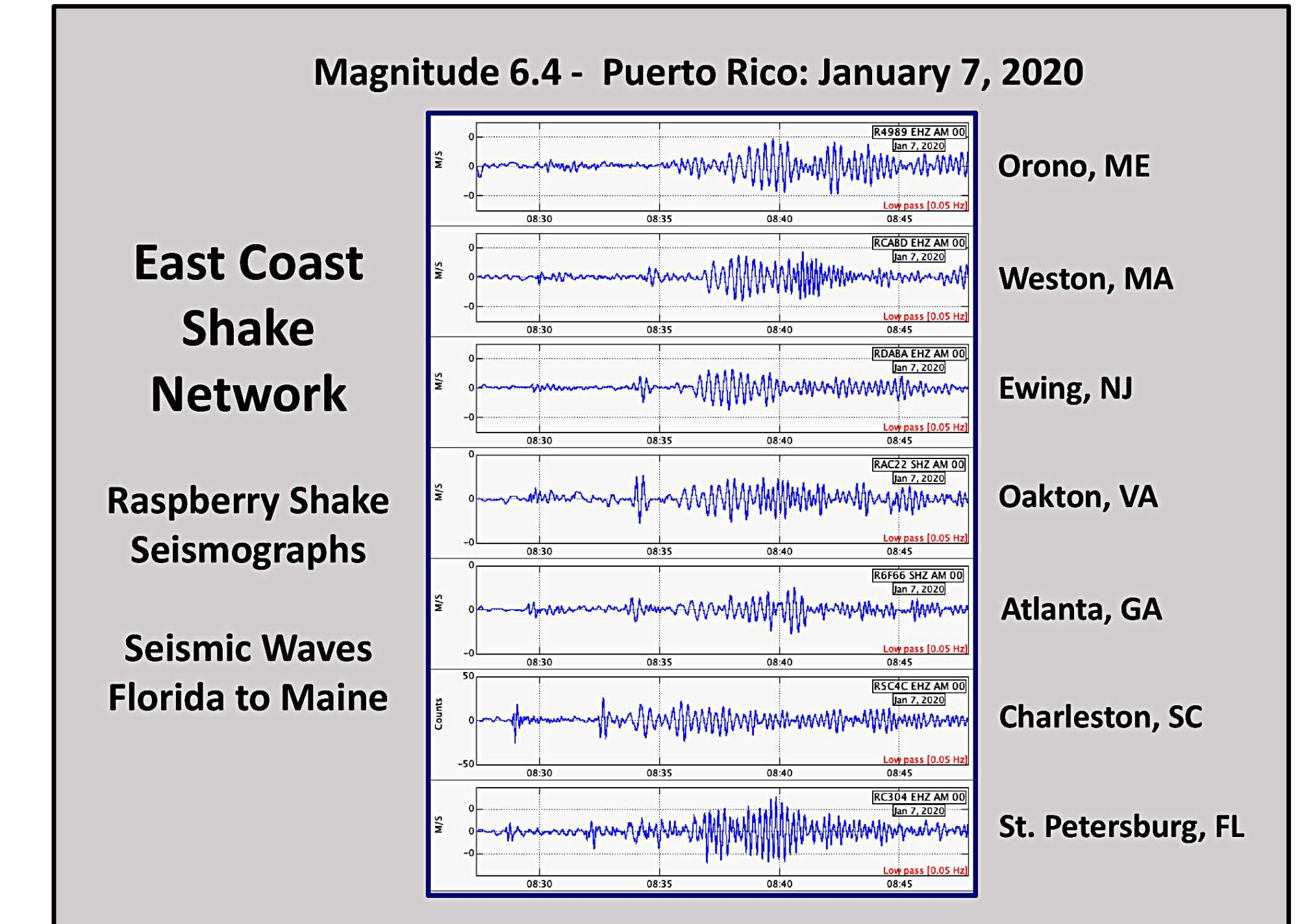
Magnitude 7.2 - Haiti



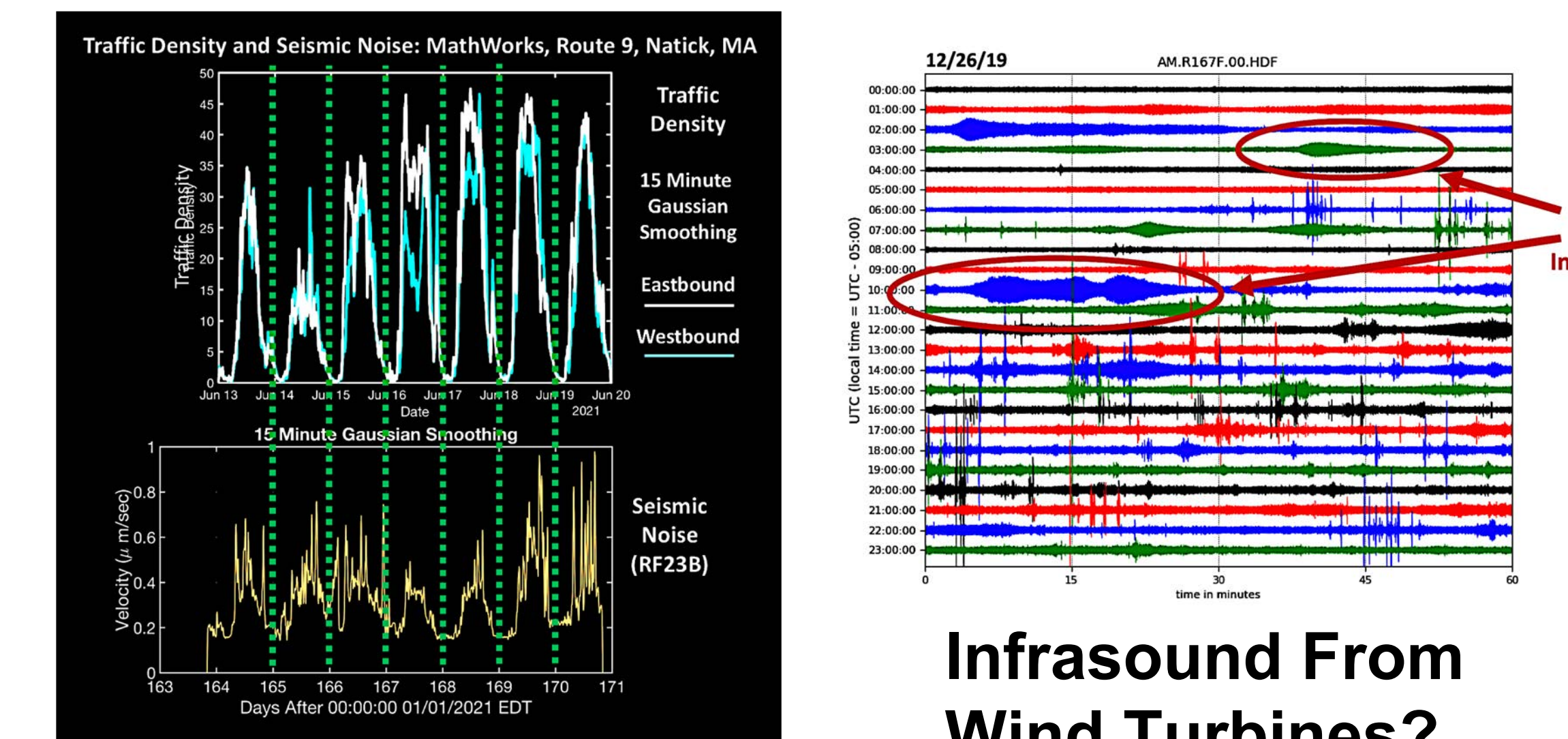
Huge Lightning Strike near Dulles Airport - Recorded in Alexandria, VA



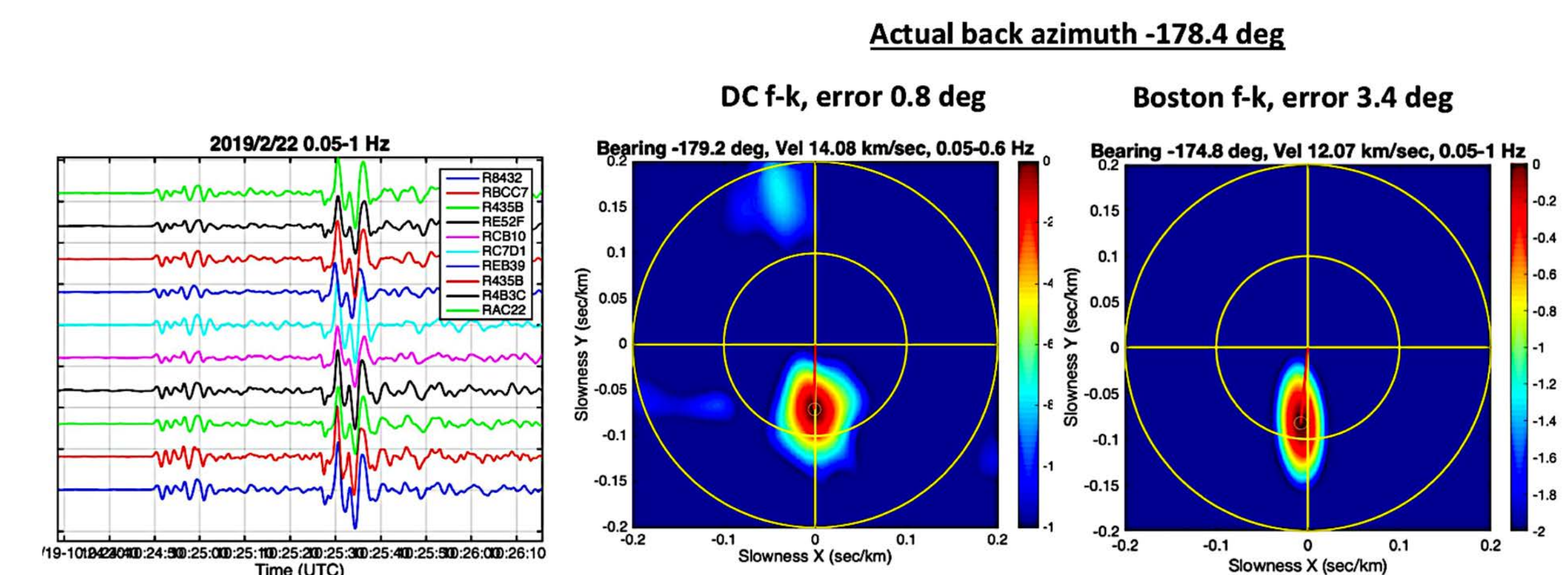
Helicopter – Doppler Shift



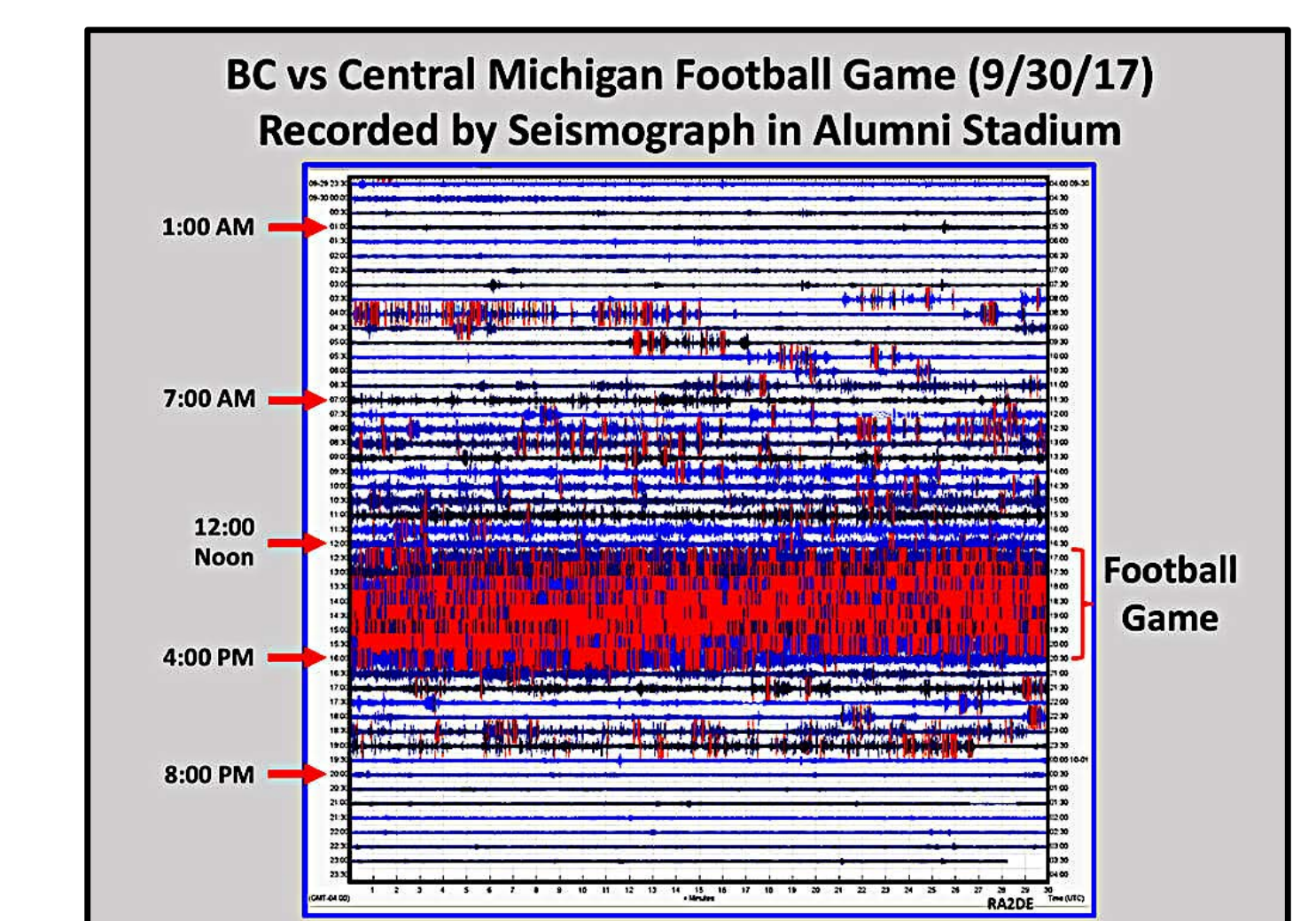
Magnitude 6.4 – Puerto Rico



Traffic on Route 9



Magnitude 7.5 – Ecuador – Across DC & Boston Area



Football Game