THAT'S THE WAY THE RASPBERRY SHAKES:
2022 UPDATE ON THE INTRIGUIGING VARIETY OF THINGS WE RECORD WITH SHAKES AND BOOMS

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2022 Eastern Section Meeting
### Seismological Society of America

People usually think of seismographs as recording earthquakes, which of course they do, but they also record lots of other things that "shake", such as activities of people and vehicle traffic. Seismologists install research seismographs in quiet places so that earthquake signals won't be obscured by non-earthquake noise. Educational and community seismographs, by contrast, are often purposely installed near human cultural noise sources so that they can be near where the people are, enabling people to interact with them. That can be a problem for monitoring earthquakes, but it's not always bad for other aspects of seismology, and can sometimes (with appropriate filtering) be less of a problem for earthquakes than might be expected. For the past several years, our group of professional and community seismologists has been exploring what the affordable Raspberry Shakes (seismic) and Booms (infrasound) are recording. Here we present a 2022 update on the intriguing variety of things we record with our Raspberry Shakes and Booms (RSBs). These RSBs, built with a high-frequency geophone integrated with a Raspberry Pi computer, often record earthquakes better than might be expected, and also record a lot of other interesting seismic events, such as: storms, snowplows, wind turbines, street traffic, aircraft, construction sites, thunder, washing machines, volcanoes, and more. We find that RSBs are surprisingly good for recording local and regional earthquakes and that they also record some large, distant earthquakes better than might be expected. Often urban and suburban areas are poorly represented with seismographs, and RSBs can fill in such locations for more uniform spatial monitoring. The growing database of RSB seismograms of earthquakes and an intriguing variety of other types of seismic sources highlights opportunities for community scientists, educators, and research scientists to collaborate in monitoring our active planet.
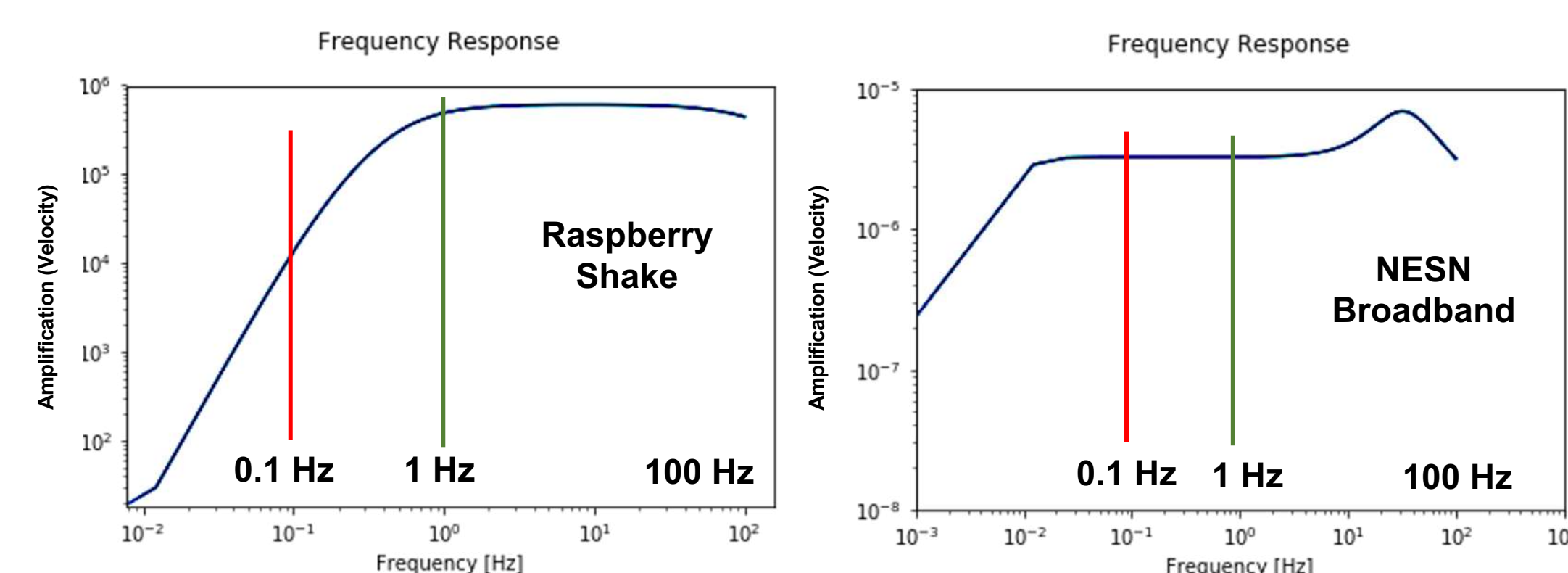
Raspberry Shake Stations

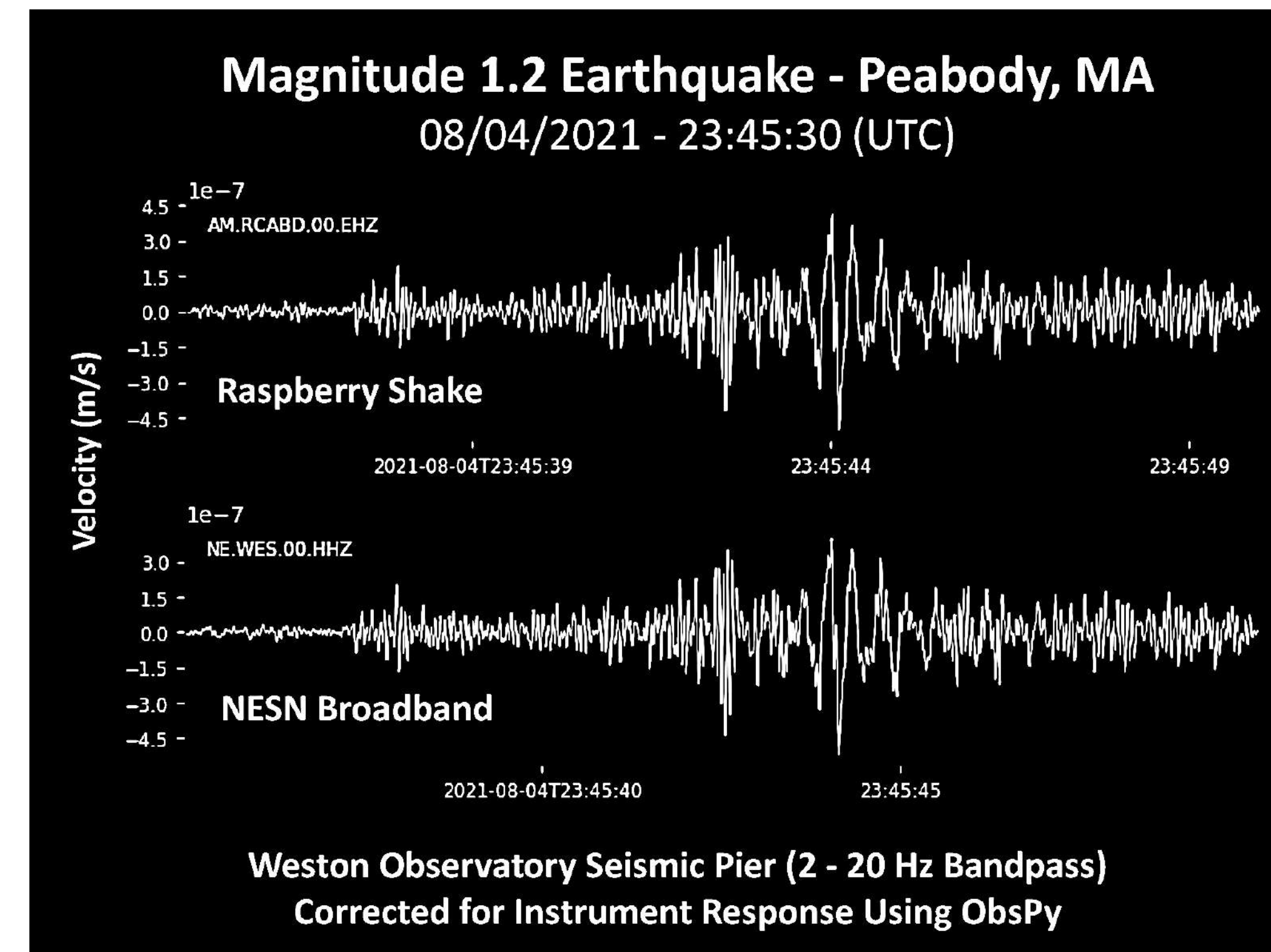*raspberryshake.org*
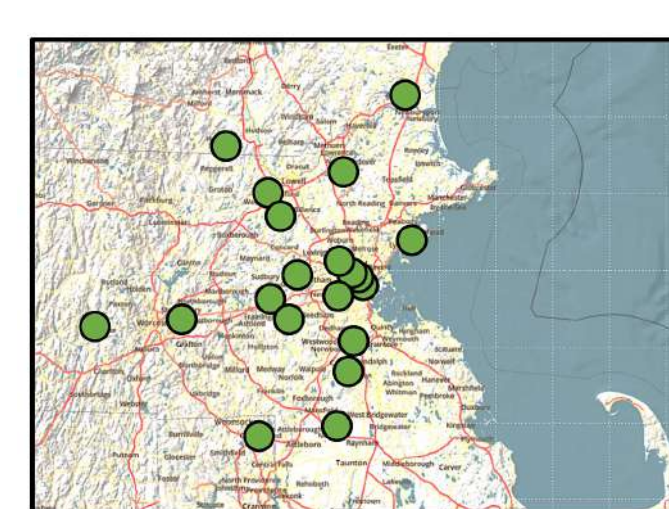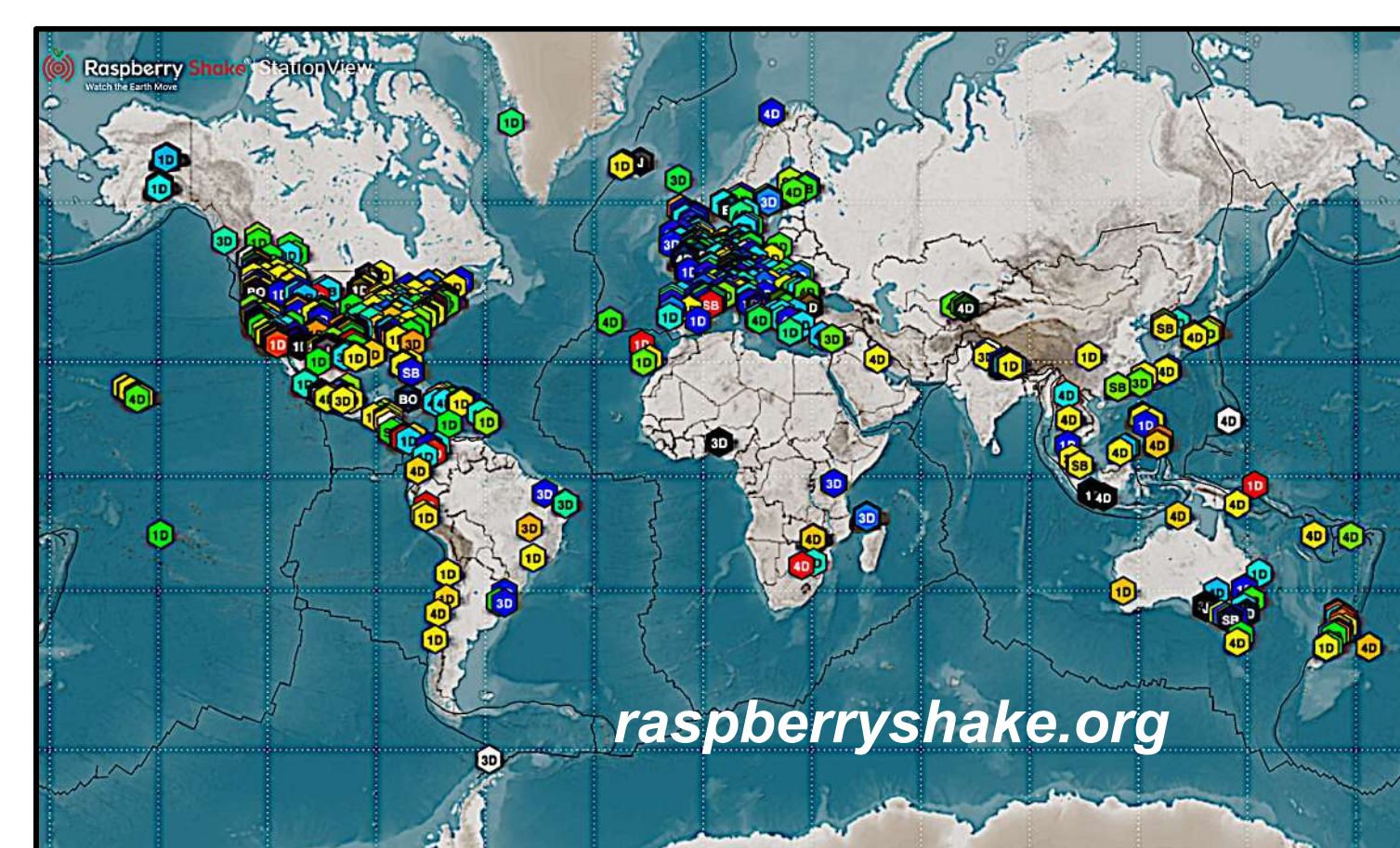
Boston Area Stations
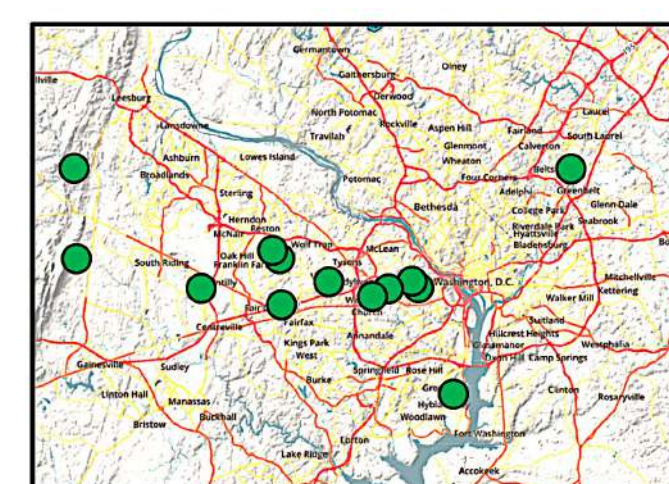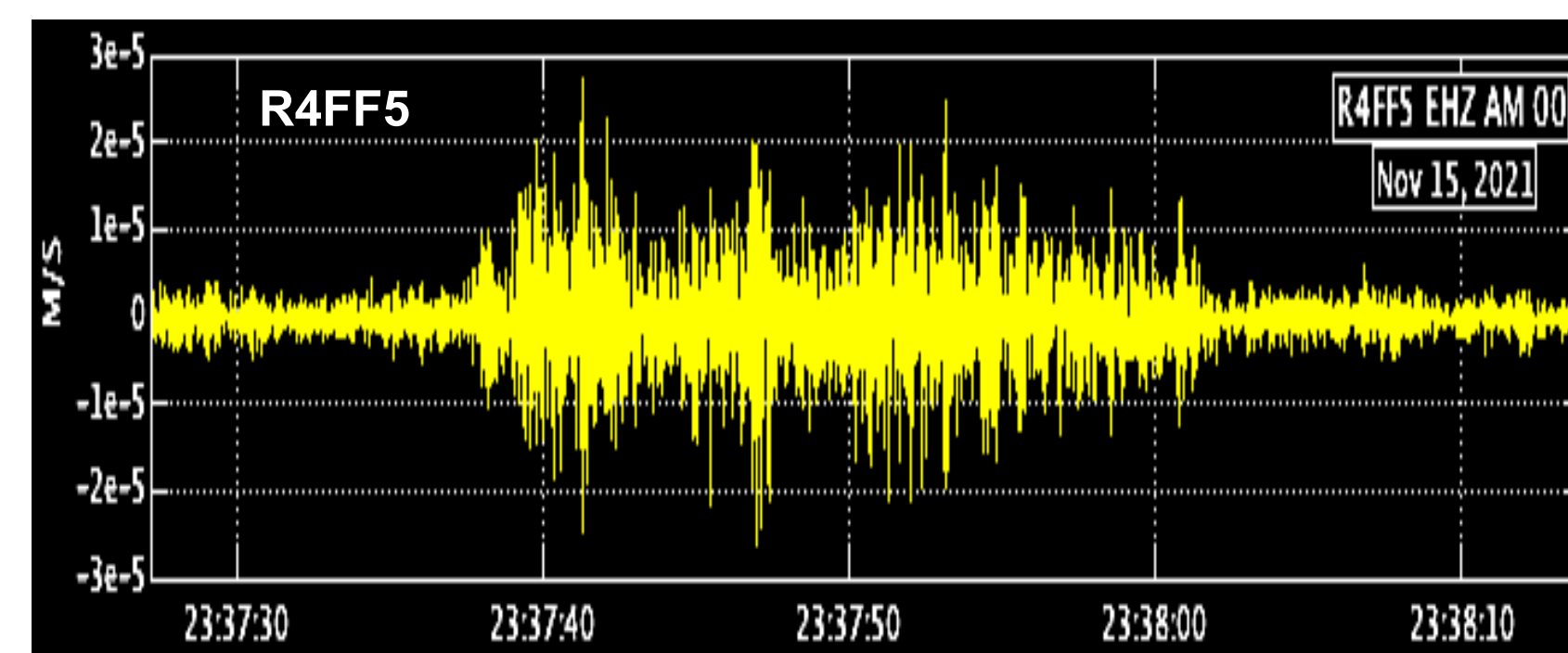
DC Area Stations

Instrument Response

Community Seismology: Recording all kinds of shaking, in all kinds of places, for all kinds of research, education, and public good.
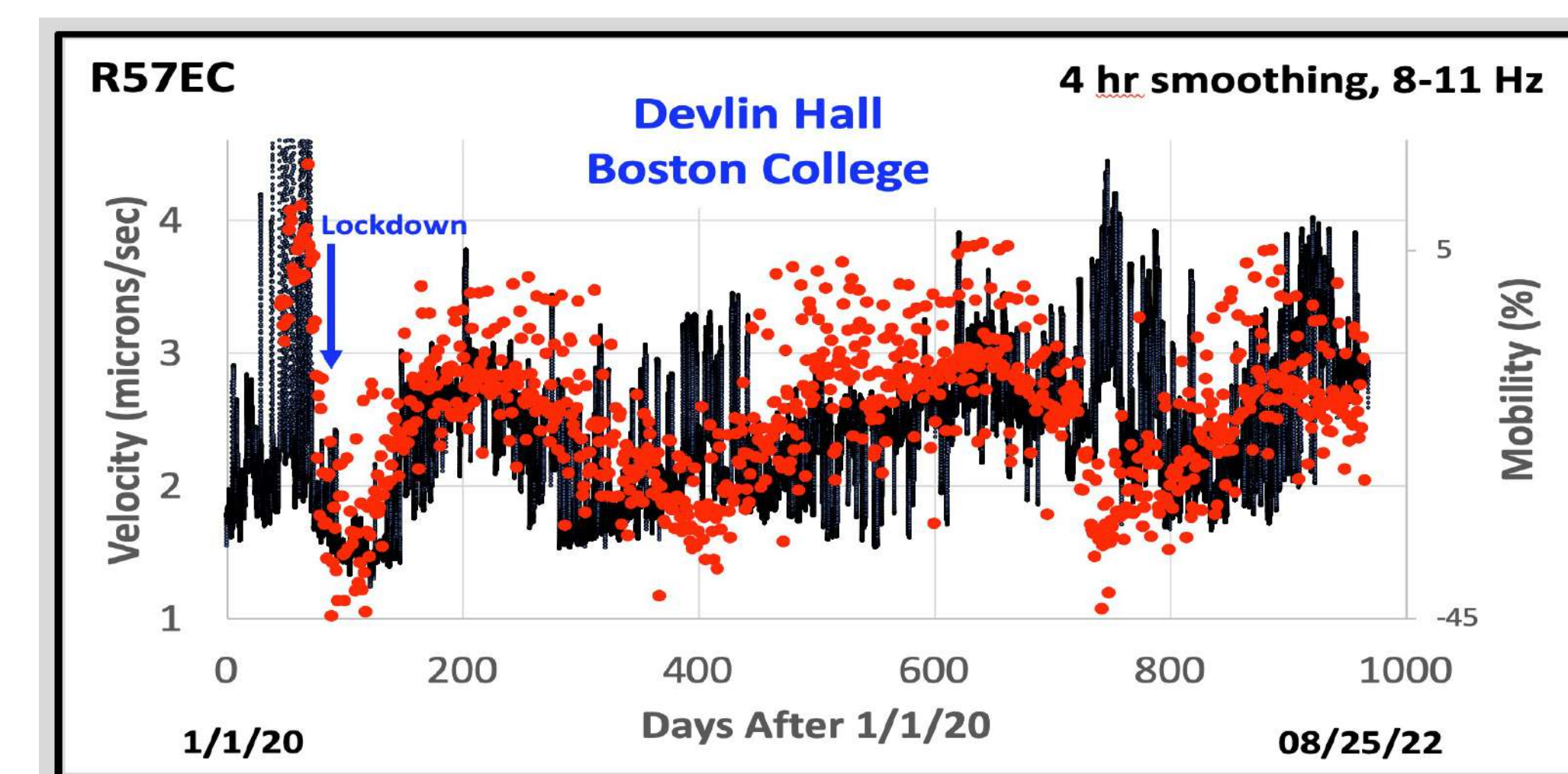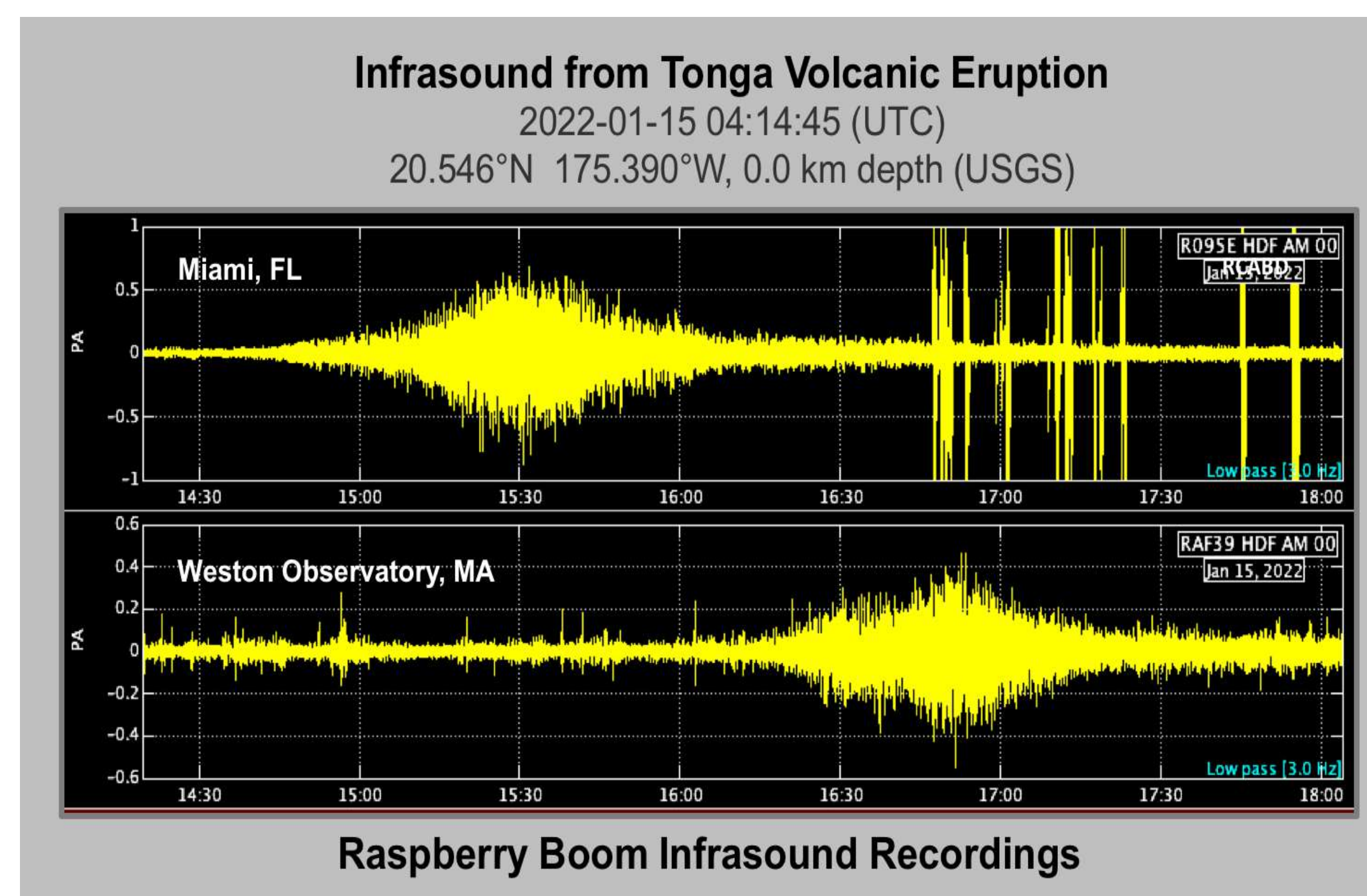

Comparing waveforms: Shake vs. Broadband

Magnitude 1.2 Earthquake - Peabody, MA
08/04/2021 - 23:45:30 (UTC)
Raspberry Shake
NESN Broadband
Weston Observatory Seismic Pier (2 - 20 Hz Bandpass)
Corrected for Instrument Response Using ObsPy

Fire Truck, Near R4FF5, North Tampa Bay, FL

Seismic Noise and COVID-19 Lockdown

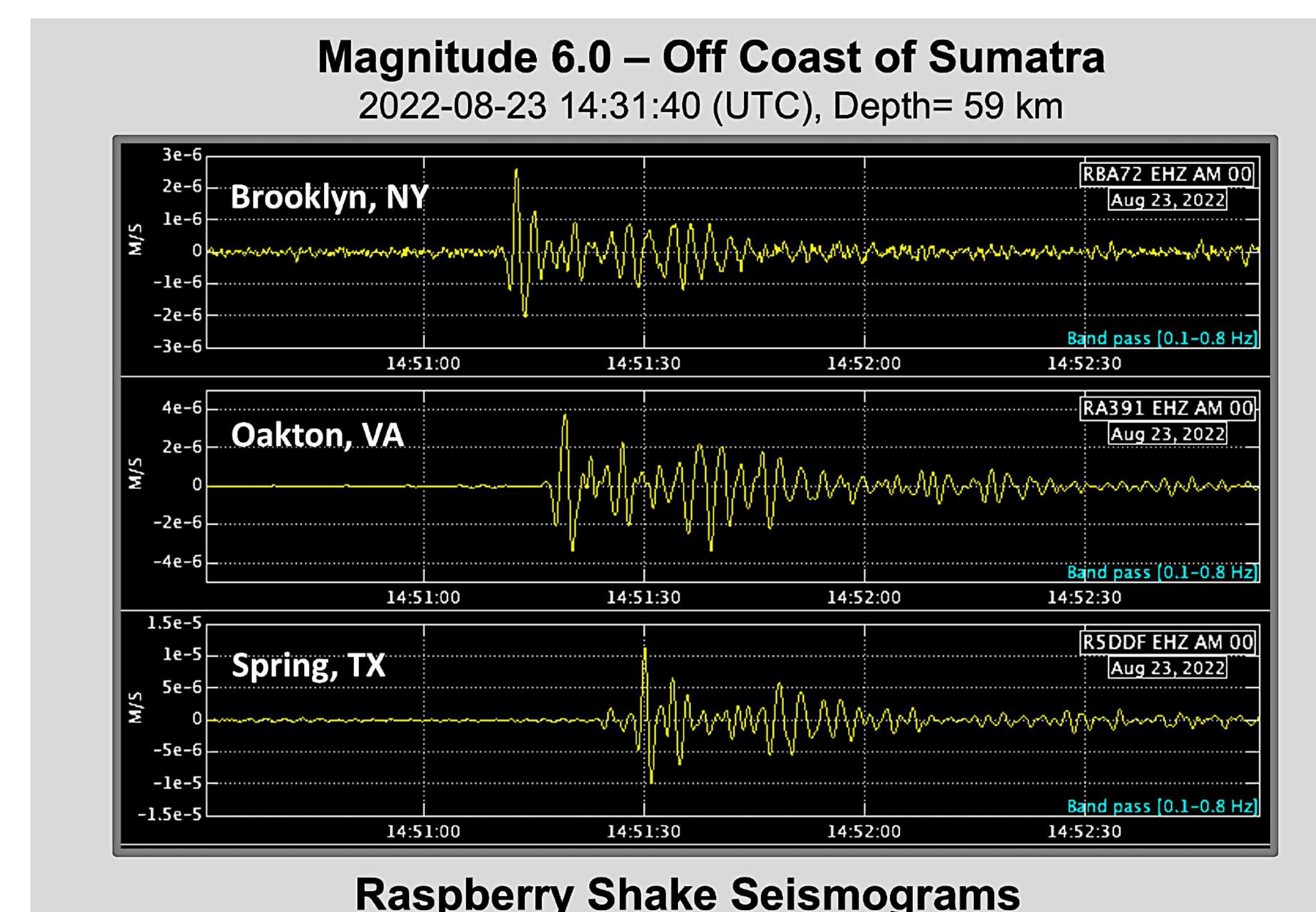**Infrasound from Tonga Eruption**

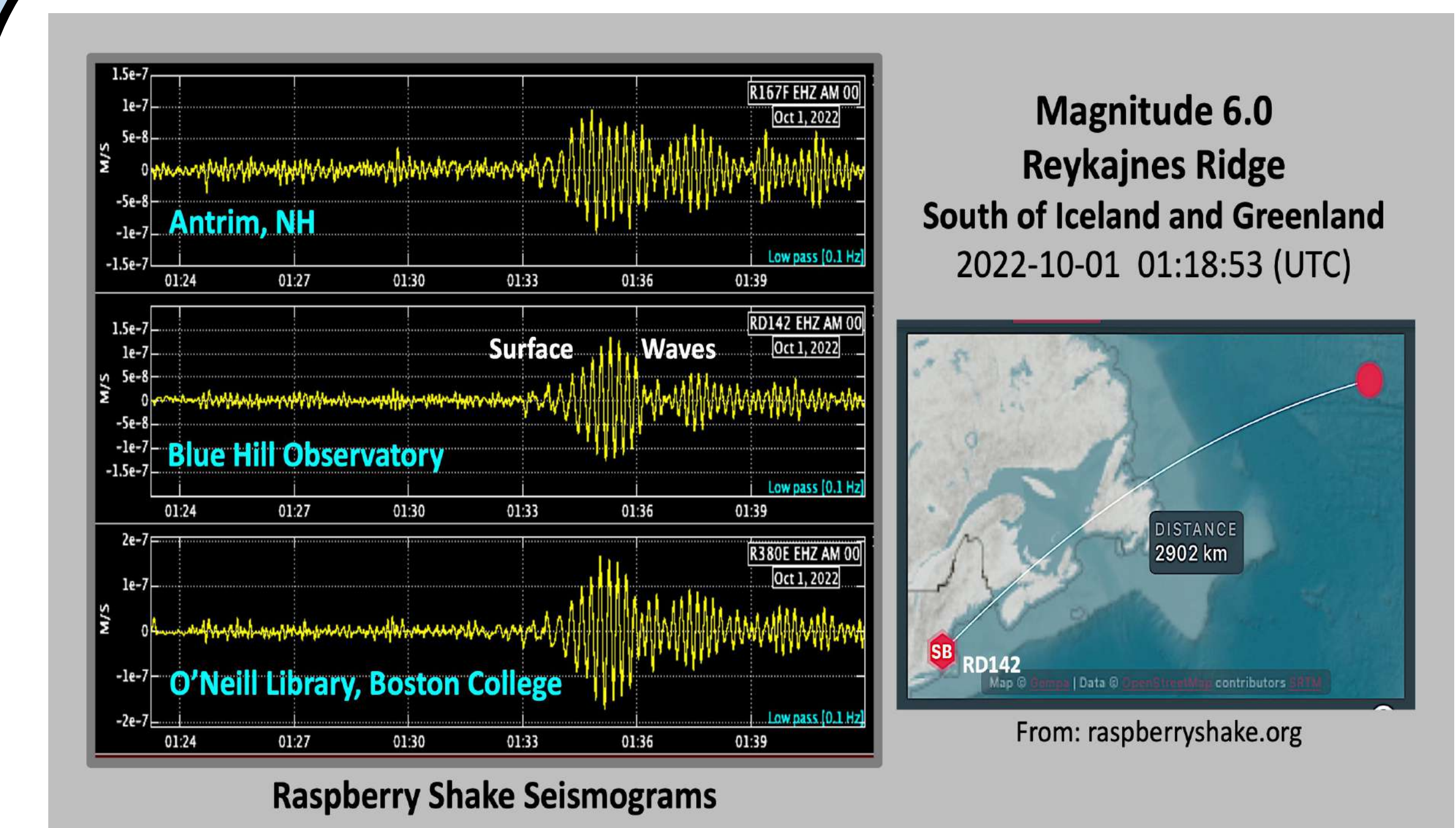Infrasound from Tonga Volcanic Eruption
2022-01-15 04:14:45 (UTC)
20.546°N 175.390°W, 0.0 km depth (USGS)
Miami, FL
Weston Observatory, MA
Raspberry Boom Infrasound Recordings

Magnitude 2.8 – Centerville, ME

Magnitude 2.8 – Centerville, Maine
2022-08-11 23:09:05 (UTC)
Weston, MA
Blue Hill Observatory
Antrim, NH
Springfield, VT
Shrewsbury, MA
Raspberry Shake Seismograms
From: raspberryshake.org

Magnitude 6.3 – Off Coast of Central America

Magnitude 6.3
Off Coast of Central America
2022-10-16 12:48:21 (UTC)
Blue Hill Observatory
MathWorks, Natick, MA
College of New Jersey
Oakton, VA
Lutz (N Tampa Bay), FL
Raspberry Shake Seismograms
From: raspberryshake.org

A Raspberry Shakes in Brooklyn: And, in Virginia and Texas, too...

Magnitude 6.0 – Off Coast of Sumatra
2022-08-23 14:31:40 (UTC), Depth= 59 km
Brooklyn, NY
Oakton, VA
Spring, TX
Raspberry Shake Seismograms

Magnitude 6.0 – Reykajnes Ridge

Magnitude 6.0
Reykajnes Ridge
South of Iceland and Greenland
2022-10-01 01:18:53 (UTC)
Antrim, NH
Blue Hill Observatory
Surface Waves
O'Neill Library, Boston College
DISTANCE 2902 km
Raspberry Shake Seismograms
From: raspberryshake.org
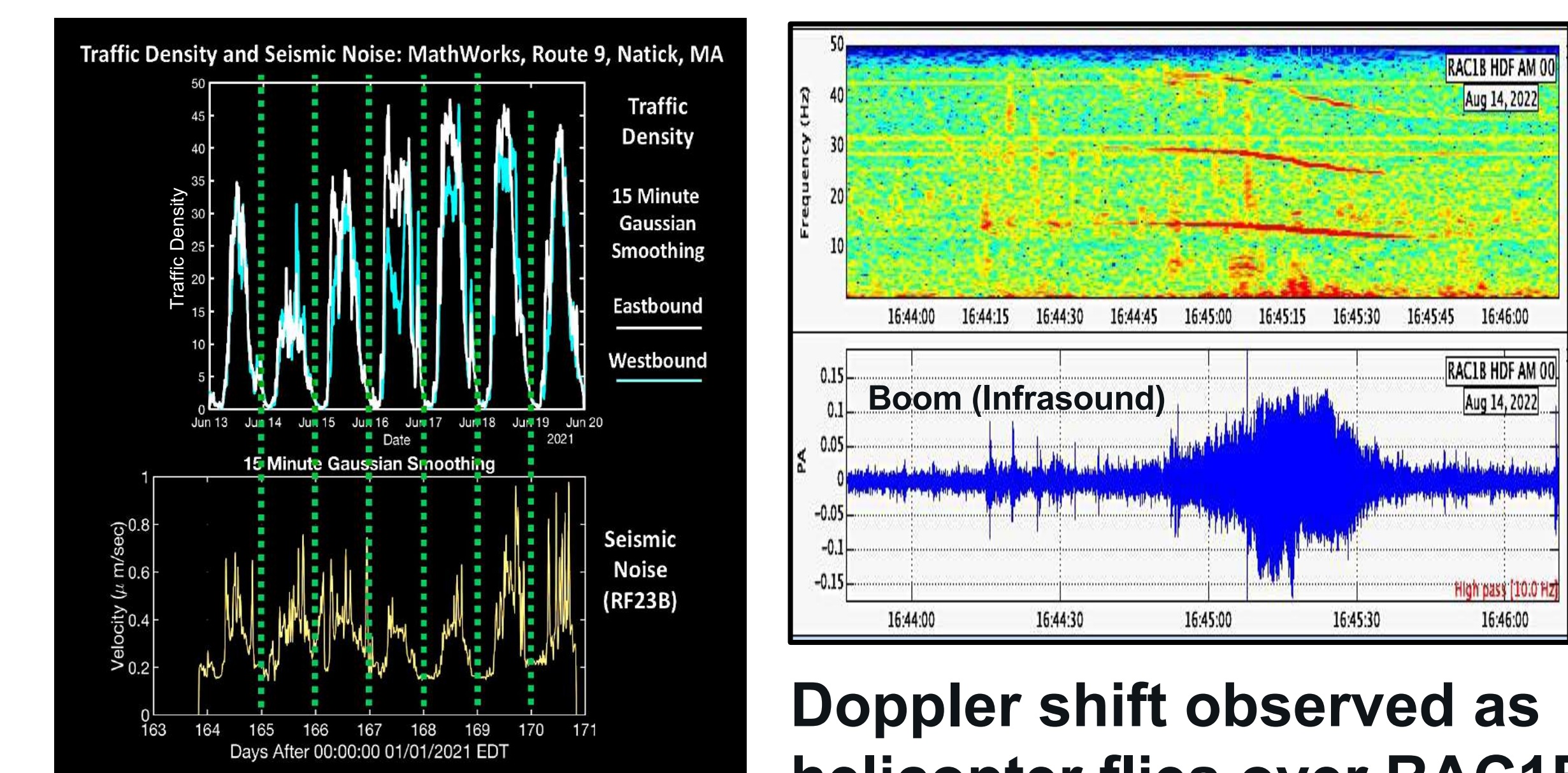
Traffic on Route 9

Doppler shift observed as helicopter flies over RAC1B in Stoughton, MA

Boom (Infrasound)
Seismic Noise (RF23B)
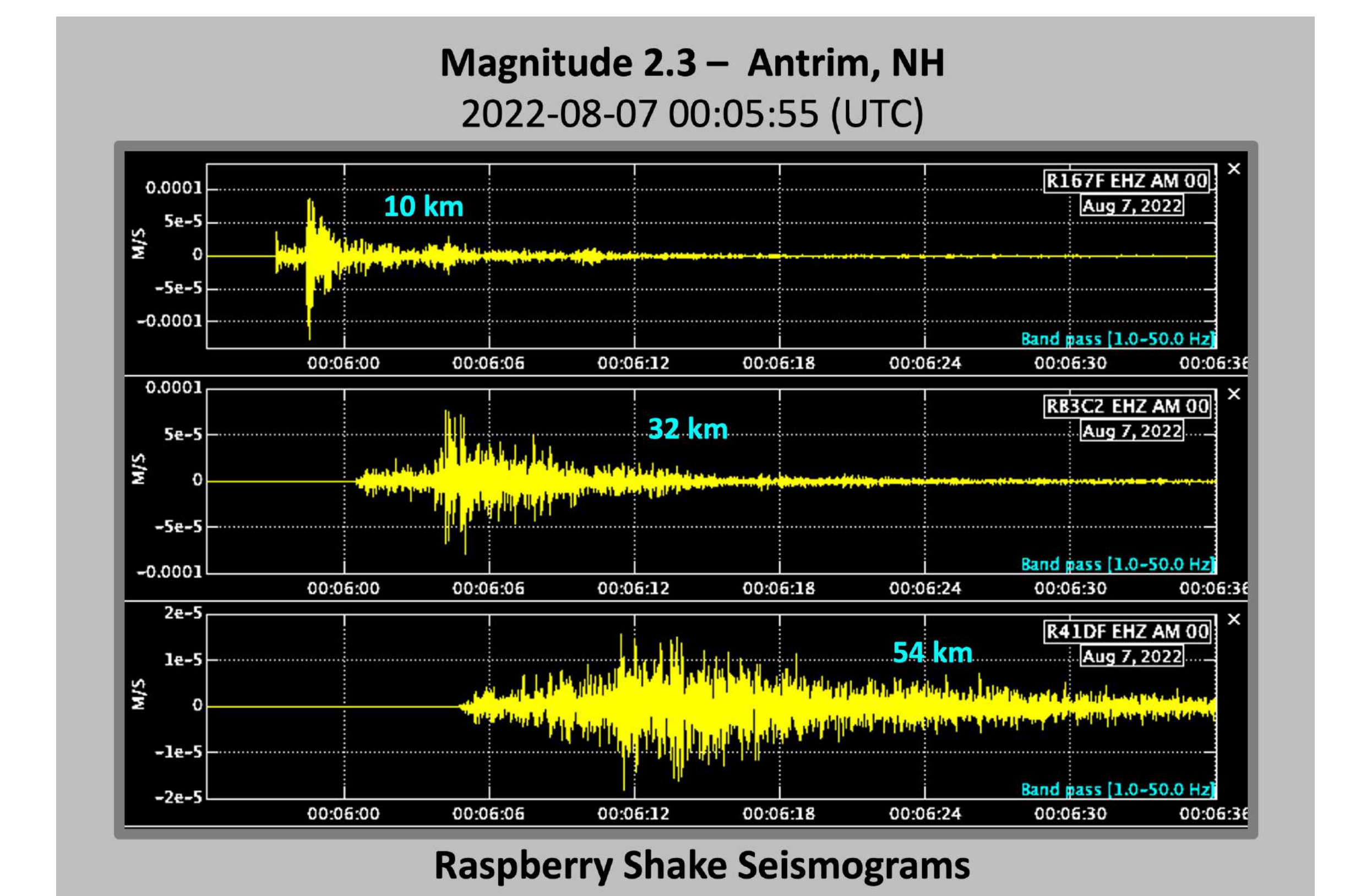
Magnitude 2.3 Earthquake 10 km East of R167F (Antrim, NH)

Magnitude 2.3 – Antrim, NH
2022-08-07 00:05:55 (UTC)
10 km
32 km
54 km
Raspberry Shake Seismograms

More on how the Raspberry Shakes, at: *Twitter.com/Weston_Quakes*