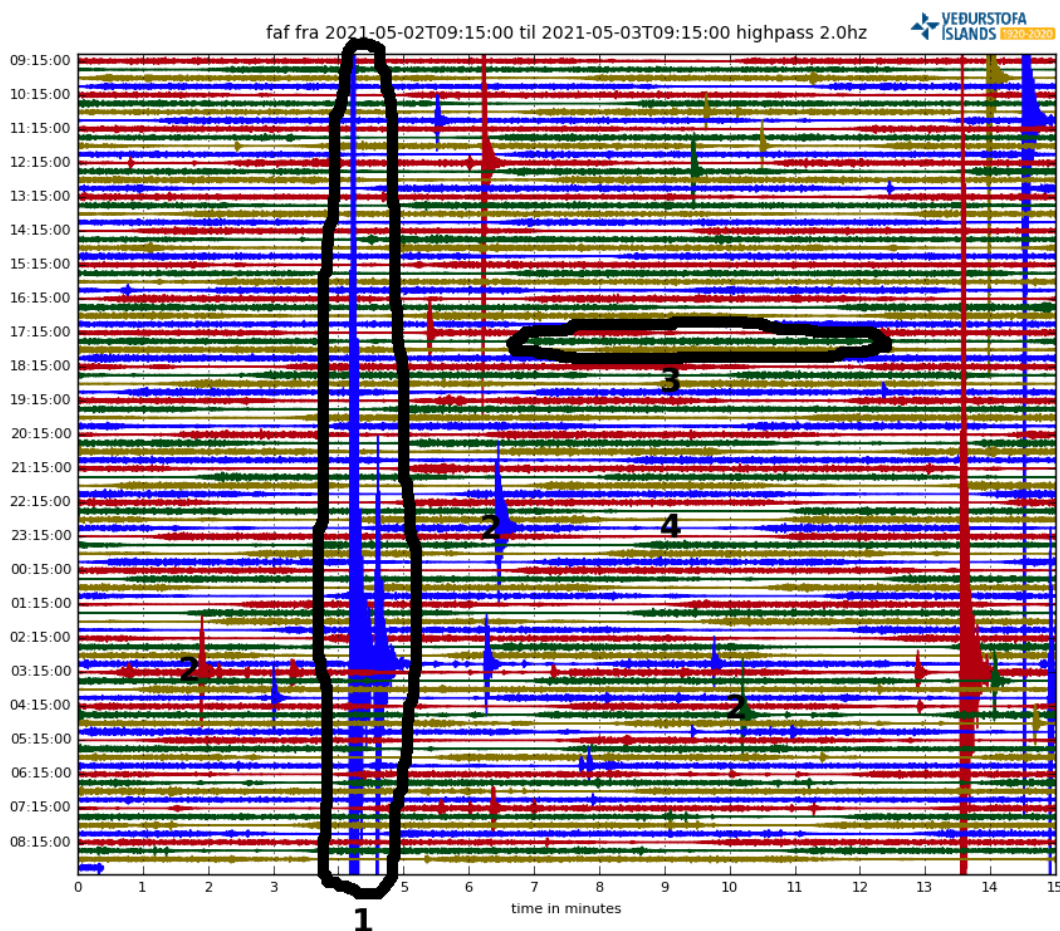


Part 1 Highpass charts

A lot of people have said they have no idea how to interpret the seismo chart. I'm no expert, just an amateur but I'll explain to the best of my knowledge. Any experts out there feel free to correct.

This is like a graph of vibrations. As usual time is along the x-axis but with each 15 minute section put beneath the previous one so you can see a whole 24 hour period at once. With each new 15 minutes the oldest line gets shoved off the top and the newest 15 minute line starts at the bottom. They're typically updated about 30-45 mins late. The 4 different colours are just to make it easier to trace each 15 mins along but they rotate, the 10:15 red line on this one will be dark green on the next update. The start time of every fourth section is down the left with the minutes to add to that along the bottom. So the big red quake on here is on the 03:15 line and about 13 mins and 30 seconds after that, so 03:28 and 30 seconds.



So, now for what they actually indicate. It is probably best to think of the vibrations in terms of sound, the further the "pen" goes from the line, the louder the sound (the bigger the vibrations).

1. This is a significant quake, 3.2, but not at this location, it was some distance away. The sudden start shows a sudden crack (probably rocks being split apart) then some settling followed by another crack (aftershock) then more settling.

2. Lots of these, but I only labelled a few. These are smaller quakes, probably more cracking, possibly in the same area as the initial crack opens more. (I don't mean a crack that opens to the surface, the quake was about 6km down).

3. Where the line is wide but 'steady' (actually lots of small vibrations) it indicates harmonic tremor, this shows magma moving under the surface, but in this case the seismo is very close to the

eruption so shows it moving right up to the vent. In other volcanoes this can be a sign of impending eruption.

4. The thin line shows nothing is happening.

This chart clearly shows the pulsing action we've seen lately with thin lines (quiet) followed by thick lines (magma moving).

The amplitude isn't "fixed", it is different for different stations and can change for one station as the scientists decide what is best to show what they are looking at. This can mean that background noise may look significant. It is also possible that in some locations industrial activity can look like harmonic tremor and blasting (quarrying, military training etc.) will look like a quake.

Note that the level of quake that is significant for volcanic eruptions is far lower than that which would be considered significant for earthquake damage. A 3.5 would be felt on the surface for about 15 miles around, it may cause cracks in a few buildings if they are not built to earthquake standards but it is nothing to worry about, it might just feel like a big truck going past the house. However, in volcanic terms quakes lower than that can be significant. In some systems, like this one, it can indicate a movement below that will allow magma to move upwards or indicate a vent opening somewhere else, or it may mean a vent closing.

Part 2 Turbulence (unrest) Charts

People are starting to look more at the other type of seismo (<http://hraun.vedur.is/ja/oroi/faf.gif>) as it gives a better view over a longer period of time. I don't know much about these but from the description it says that it averages the movement over a minute. So it gives a very different trace than the ones we have been looking at. So to understand them a bit better I've compared the two by putting vertical lines for every 6 hour section on the "oroi" one and corresponding horizontal lines on the highpass. (Actually on the highpass I put the lines just above the trace so I don't cover the line itself.) The blue line on the oroi one is the only frequency represented on the highpass.

So in section 1 we see all is quiet on the highpass and the line is quite low on the oroi, we can just see that starting to rise towards the end but this is barely visible on the highpass.

Section 2 the blue on the oroi rises as the harmonic tremor on the highpass increases, and whilst it is quite hard to see the blue widens vertically as the harmonic tremor pulses because in some minutes there will be little movement and in others lots of movement.

Section 3 As the amplitude of the harmonic tremor increases and the pulses become more pronounced the top of the blue goes up whilst widening vertically again. In the second part of the section as the harmonic tremor becomes continuous we see the oroi blue trace become thinner and high.

Section 4 (and the very end of section 3) As the pulsing returns the oroi's blue widens vertically again.

I would really welcome any geologists on here explaining the oroi trace more as I haven't been able to find traces like this on the internet and the description isn't exactly enlightening.

Fagradalsfjall (faf)

