What On Earth Was That?!
Listening to the Sounds of Earthquakes

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The sounds of earthquakes have been used sparingly in seismology research, but the potential for the use of the human ear as analytic tool has been largely overlooked. “Audification” - the process of turning seismic data into sound - could offer a deeper, more intuitive approach to analyzing earthquakes. In addition to listening to earthquakes, we are able to take acoustic emissions data from laboratory experiments and listen to sounds generated from that data. Because the earthquakes occur mostly below the range of human hearing (and acoustic emissions occur mostly above it), we have to apply filters to the data, and then time compress it to shift the frequencies into the audible range. In addition to these mandatory steps, we took data from multiple stations and played them through speakers that were setup to match the spatialization of the seismometers that the data came from. This way we get a real two-dimensional audio representation of the data. We found that the most important factors in differentiation between natural earthquakes was the source and seismometer location, and the type of seismometer. We found that our experimental data mostly did not mimic the sounds of earthquakes very well, even when both data types were shifted into the same frequency range. We think that the way that acoustic emissions data is collected may cause it to sound fundamentally different from data that is collected via seismometers in the earth. Going forward, we question to what extent friction experiments and natural earthquakes are manifestations of the same phenomena, and how we can use sound to gain insight into their similarities and differences.