

Effect of Explosive Volcanic Eruptions on Frequency Data

Volcanoes and Seismic data: Is There A Correlation?

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Abstract

This study analyzed seismic data from the Hanford LIGO site and sought to find relationship indicators between volcanic activity on the Alaskan Peninsula and the Seismic data. The primary purpose is to determine if there are frequencies that peak as a result of explosive Alaskan eruptions.

Introduction

Gravitational wave detection must be buffered from background "noise" vibrations. Many of the vibrations are periodic and are able to be anticipated and easily compensated for within the control systems of the equipment. The question for this investigation began by wondering how the systems responded to unpredictable or random seismic events. Volcanic eruptions were chosen as an unpredictable and random event. choosing volcanic eruptions enabled data to be gathered from events that occurred at similar distances, seismic events that occurred at similar depths, and similar intensities. This investigation further wanted to find indicators in the seismic data from the Hanford LIGO site that would indicate volcanic eruptions. Eruptions from the Alaskan peninsula were chosen due to the relative high activity and number of volcanoes present.

Procedures

Volcanoes were first identified using the Alaskan Volcano Observatory website. Volcanoes were chosen that had explosive eruptions within the data range available from the LIGO eLab Network. When a representative eruption was identified the corresponding seismic data was obtained. Seismic data was then interpreted in order to find a relationship between the volcanic event and data readings at the Hanford Site.

Results

Figures

Veniaminof 3.2.2006

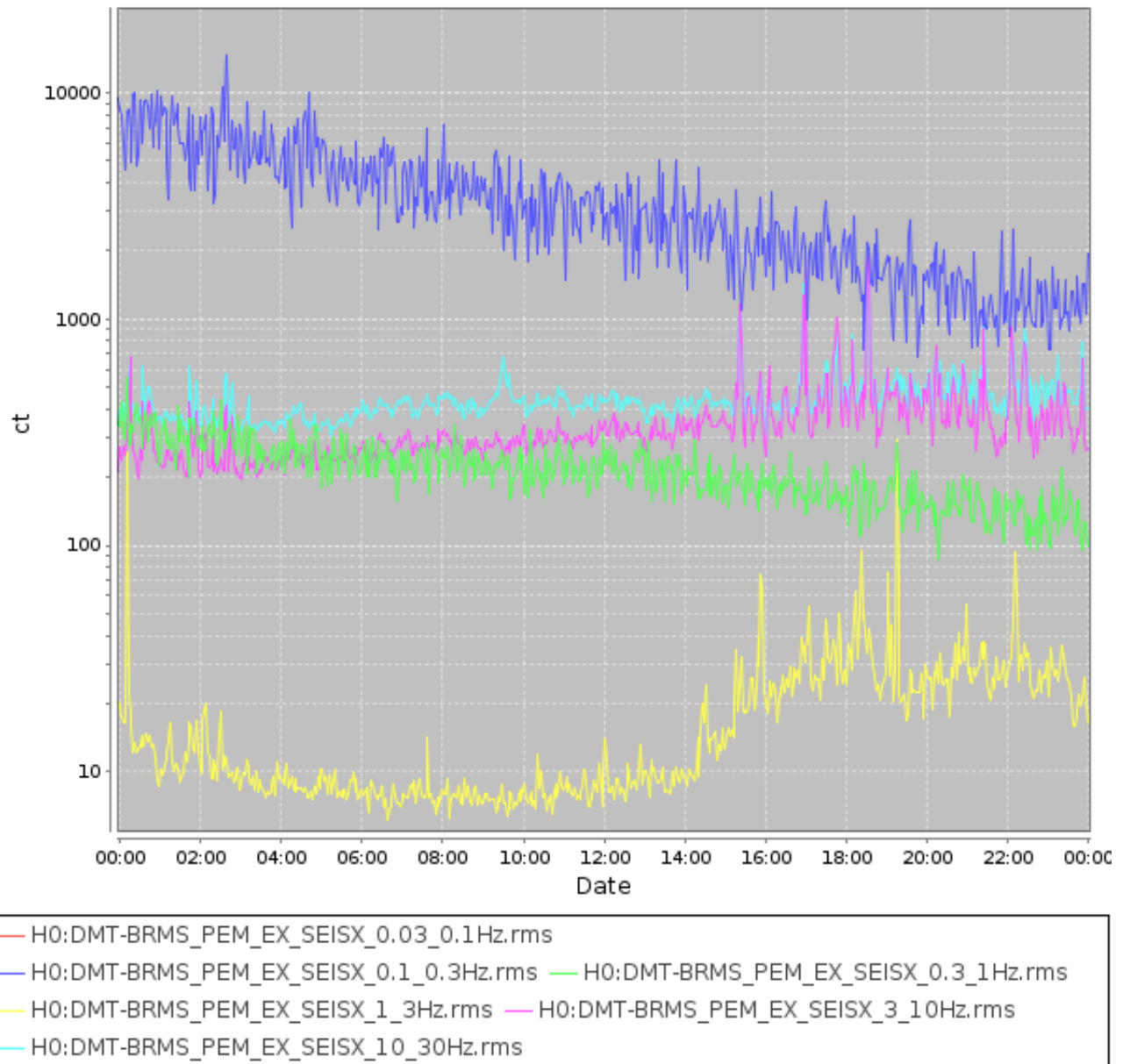


Figure 1. Veniaminof Eruption 1 - 0500

Veniaminof 2.1.2008

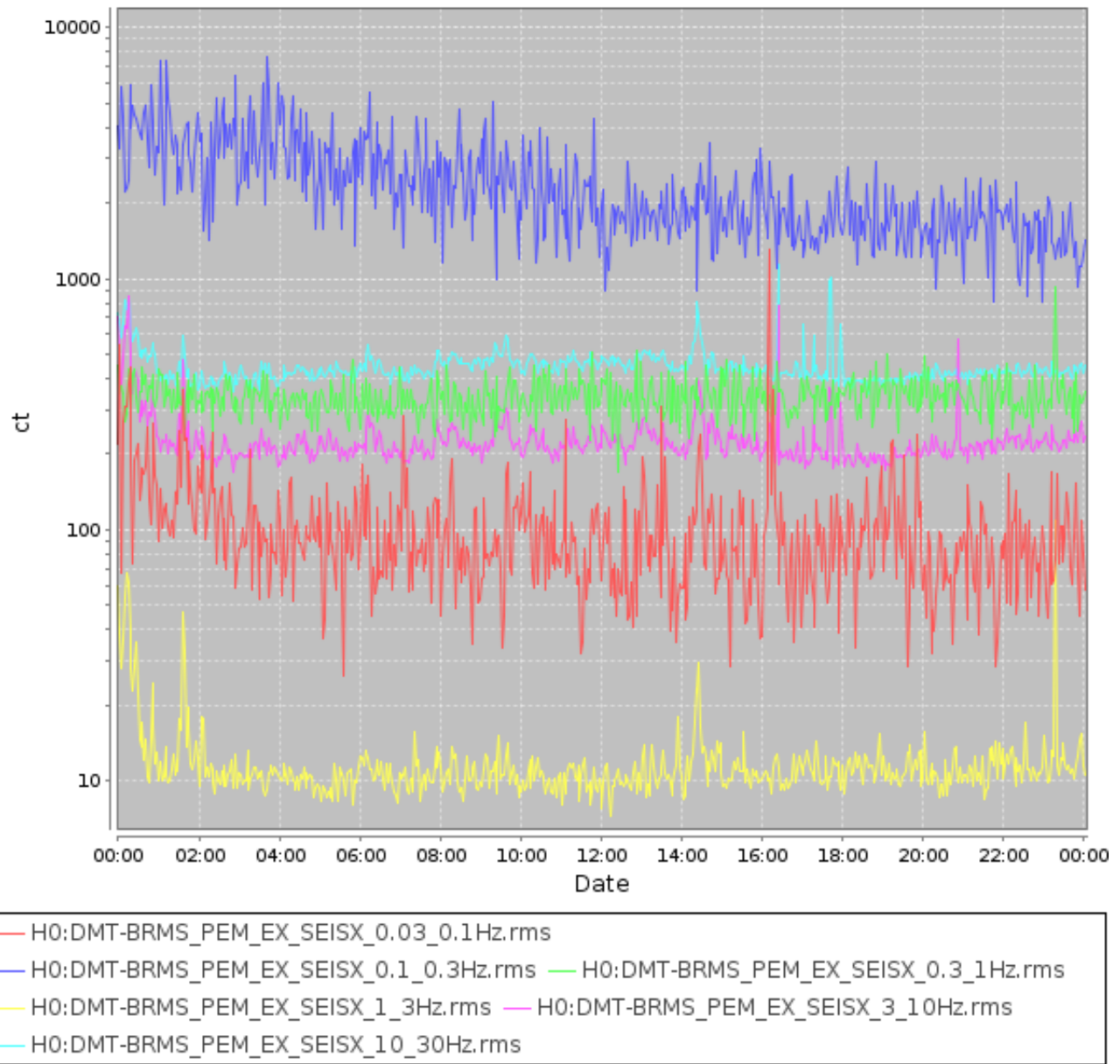


Figure 2. Veniaminof Eruption 2

Pavlov 8.14.2007

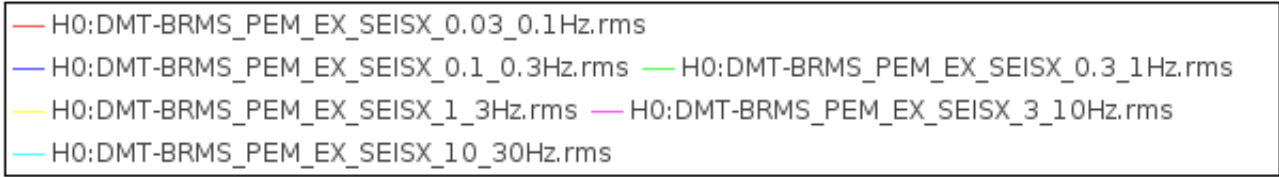
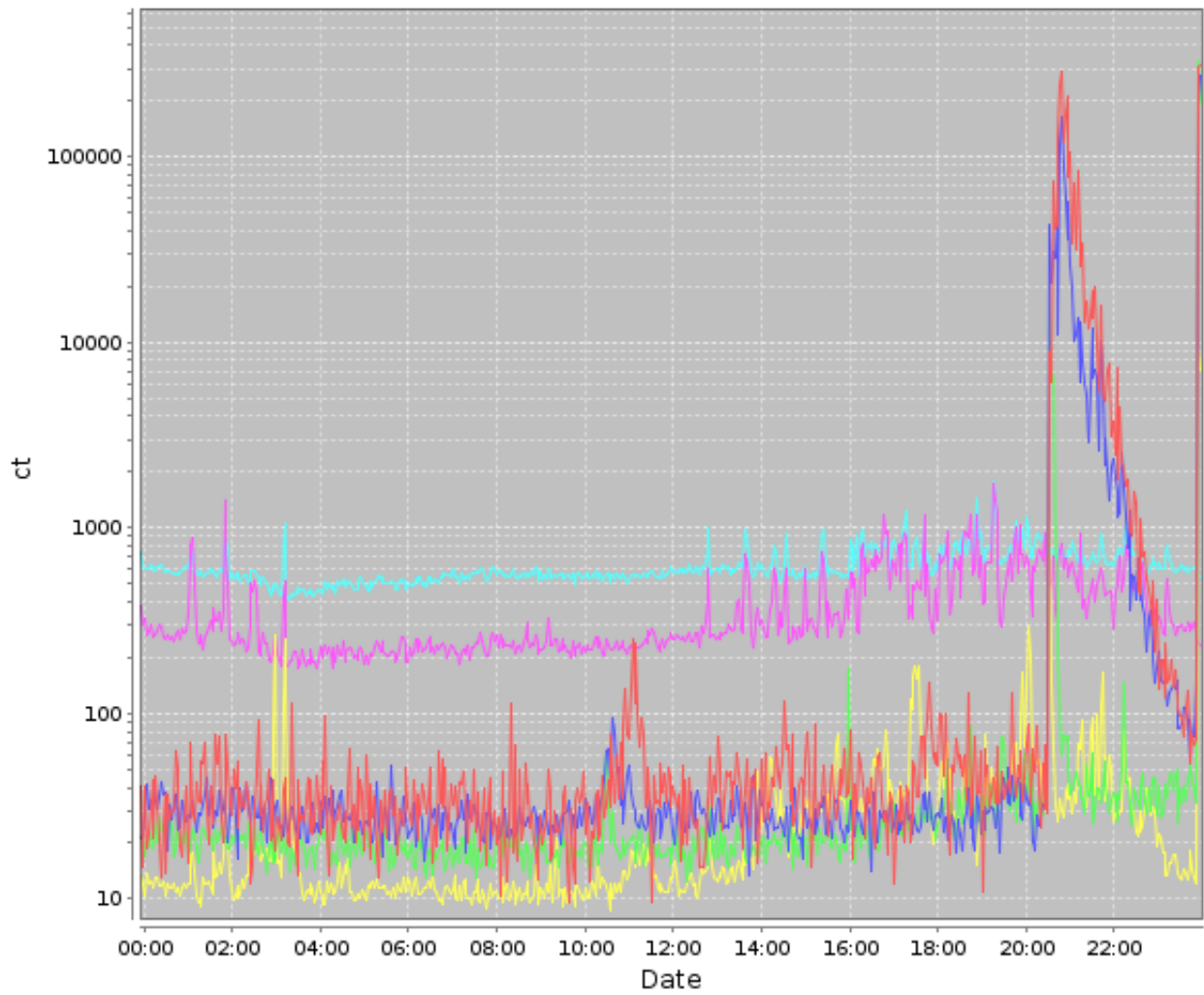


Figure 3. Pavlov Eruption 1

Figure 4. Fourpeaked Eruption 1

Discussion and Conclusions

Bibliography

<https://www.avo.alaska.edu/>

