ID: **O2.3-171** Type: **Oral**

Rock Valley Direct Comparison Experiment: An Overview

Tuesday 20 June 2023 11:40 (15 minutes)

In 1993, a shallow earthquake sequence occurred in Rock Valley, Nevada National Security Site. The largest event, M3.7, was followed by eleven M>2 events ranging in depth from 1-3 km. All events were well constrained due to the deployment of stations early in the sequence. Comparison of these shallow events to nearby historic nuclear tests identified gaps in our ability to discriminate these event types. To answer the question about the physics of shallow earthquakes, the Rock Valley Direct Comparison Experiment was conceived. We will conduct two chemical explosions at similar hypocenters to the earthquake sequence to understand the discrimination features between these types of events. We have systematically relocated the 1993 events, varying velocity models and codes, but using a common pick data set to choose the experiment borehole. Three additional boreholes are planned and will be instrumented to obtain microseismicity data, sample fault properties, and record the chemical explosions. We are installing a dense seismic network, including reoccupying stations that recorded the 1993 earthquakes. We have developed a 3-D geologic framework model for visualization, and for modeling and simulation efforts. We expect this unprecedented data set will address seismic waveform differences between earthquake and explosion sources.

E-mail

snelsonc@lanl.gov

Promotional text

The Rock Valley Direct Comparison Experiment will acquire chemical explosion data to compare directly to a known earthquake sequence thereby providing an unprecedented data set to enhance modeling of discriminates for underground explosion events.

Oral preference format

in-person

Primary authors: Ms SNELSON, Catherine (Los Alamos National Laboratory (LANL)); Mr ABBOTT, Robert (Sandia National Laboratories (SNL))

Co-authors: WALTER, William R. (U.S. Department of Energy, National Nuclear Security Administration); ZEILER, Cleat (U.S. Department of Energy, National Nuclear Security Administration)

Presenters: Ms SNELSON, Catherine (Los Alamos National Laboratory (LANL)); Mr ABBOTT, Robert (Sandia National Laboratories (SNL))

Session Classification: O2.3 Seismoacoustic Sources in Theory and Practice

Track Classification: Theme 2. Events and Nuclear Test Sites: T2.3 Seismoacoustic Sources in Theory and Practice