1. MOTIVATION & GOALS

- NASA Desert Research and Technology Studies (RATS)
  - Engineering based studies on the operability of performing geophysical field studies that evolved to full-scale multi-week simulations of lunar explorations with realistic geologic objectives
  - 2010: realistic human rover traverses in and around the San Francisco Volcanic Field (SFVF) with prototype habitable rovers, habitats, & communication restraints
  - Geophysical field and exploration were not included

2. STUDY REGION & APPROACH

Study Region:
- 7 km x 7 km region, analogs to Taunus-Litrow lunar region, located within the SFVF
- Roughly centered on SP Carter (center of 250 m of relief)
- Contains under cone volcanoes & lava flows
- Includes significant portion of RATS 2010 rover traverses
- Eight areas encompass similar geologic settings
  - Used for simulated crew extravehicular activities

 Traverse Mission Based Approach:
- Assumes that geological objectives were secondary in relation to RATS 2010
  - Geologic traverse planning
  - Field season planning based on RATS 2010 pre-existing data
    - Primarily USGS geological map of the SFVF, SP Carter region

3. RESULTS

- Geophysical lines and broadband installation locations were less than 10m from RATS 2010 traverse EVA science stations
- Geophysical and GPR surveys were performed along the route of the RATS 2010 rover traverse paths. Assumed these geophysical instruments were mounted on the rover, but did not directly route the data.

4. CONCLUSIONS

- Geologic interpretations are limited, providing “snapshots” of subsurface layering and structure to a depth of ~40 m at specific traverse locations
- Verses overall regional structure
- Initial interpretation, Area 3 apparent seismic velocity profiles, results:

5. NEXT STEPS

- Updates for likely 2-D subsurface variations:
  1. Modify analysis to receive for dipping layers
  2. 2-D inversion analysis of arrival time data

Geophysical Traverse Operations:
- Inclusion of seismic measurements on a planetary traverse require pre-coordination with geodetic hypotheses for proper seismic ray design to provide appropriate connection between interpretation of subsurface layering and structure, with visible surface features.

   - Planetary Traverse Operations:
     - Maps: Maganetometry results
     - Ground penetrating radar results
     - Broadband seismometer (SP data set)