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**Atmospheric Observations from High Altitude Solar Balloons**

ALEXIS VANCE, JAMEY JACOB, BRIAN ELBING, Oklahoma State University-Stillwater — Solar balloons provide a potential platform for atmospheric observations for both terrestrial and extraterrestrial environments. Unlike traditional helium balloons, a solar balloon generates lift by absorbing solar radiation, which raises the temperature inside the envelope. Using these balloons, we are able to collect data on atmospheric conditions at variable altitudes for multi-hour durations. As the air in the envelope is heated, the buoyant force exerted on the balloon will cause it to rise in the atmosphere. Changes in atmospheric conditions are measurable through the resultant changes in the solar balloon's flight dynamics. A recently funded NASA PSTAR project plans to demonstrate the ability to use solar balloon-based infrasound measurements to study seismic activity and atmospheric conditions in Oklahoma. This will serve as a technology demonstration and Earth analog for the proposed mission to study Venus using solar balloons as an aerial platform for collecting atmospheric and infrasonic measurements. In preparation for these analog missions, scheduled for the summer of 2021, we have begun launching balloons with various data packages. This presentation will report on the preliminary solar balloon launches and measurements.

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