# Toward measurements of elastic wave velocities of laboratory analogs of Titan’s organic materials

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The seismometer of Dragonfly Geophysics and Meteorology Package (DraGMet) onboarded on NASA’s *Dragonfly* will measure the seismic activity occurred in Titan. In addition to the passive seismic survey using natural Titan quakes, we will perform the active seismic survey, in which a shaker artificially generates vibrations and wave fields transmitted in shallow subsurface are analyzed. Through the active seismic survey, the shallow subsurface structure down to several to tens meters in depth will be investigated. The shallow subsurface structure includes ice and organic sediments, organic aerosol layer, linear dunes and interdunes, impact structures, and liquid hydrocarbon aquifer. Thereby, the active seismic survey by the DraGMet will first provide geological and geophysical evidence to understand surface processes occurred on Titan. To reveal the detailed subsurface structure, however, the elastic wave velocities of target materials are required. Despite its importance, there are no experimental studies to investigate the elastic wave velocities of laboratory analogs of organic materials on Titan. Here, we will present our methodology development to measure elastic wave velocities of laboratory analogs of Titan’s organic materials at low temperatures. We first generate laboratory analogs of Titan’s organic materials using a radio-frequency generator and low-temperature chamber (Hirai et al., submitted). The small amount of analog material produced makes it challenging to measure its elastic wave velocity at low temperatures. We will present our progress report toward measurements of elastic wave velocities of laboratory analogs.

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