Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

**Study of the plume surface interaction cratering process using stereo photogrammetry**[1] LOKESH SILWAL, DANIEL C. STUBBS, BRIAN S. THUROW, MASATOSHI HIRABAYASHI, VRISHANK RAGHAV, DAVID E. SCARBOROUGH, Auburn University — With NASA's renewed interest in returning humans to the Moon through the Artemis program, understanding plume surface interactions (PSI's) has become vital to ensure that future lunar missions are conducted safely and successfully. PSI's encompass the interaction between the rocket plume of a craft landing on the surface and the surface itself. These interactions have a potential to create a crater in the surface and can also lead to a formation of large cloud of particulate around the landing sites. The current work seeks to employ non-intrusive optical diagnostic technique such as stereo photogrammetry for full-domain, three-dimensional measurements of crater geometry during the PSI process. The experiments were carried out on a bench-scale, atmospheric facility with nozzle height taken as a varying parameter. Two high-speed cameras were arranged in stereo configuration which allowed for high spatio-temporal resolution of the crater formation process. Preliminary experiments showed that the dust cloud created from the ejected particles limited the optical access of the crater. Thus, primary focus of this work will be to overcome the challenge associated with applying the current optical diagnostic technique for studying the PSI process.

[1]This work was supported by an Early Stage Innovations (ESI) grant from NASAs Space Technology Research Grants Program - Grant Number 80NSSC20K0300. The technical point of contact for this project is James Mantovani from Kennedy Space Center, FL.

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Date submitted: 10 Aug 2020 Electronic form version 1.4