The Dust Electric Waveform Detector (DEWD) for the LADEE Mission. S. D. Bale\(^1\), K. Goetz\(^2\), J. Halekas\(^1\), G. T. Delory\(^1\), R. P. Lin\(^1\), C. A. Cattell\(^2\), and M. L. Kaiser\(^3\), \(^1\)Space Sciences Laboratory, University of California, Berkeley, CA  94720-7450 (bale@ssl.berkeley.edu), \(^2\)School of Physics and Astronomy, University of Minnesota, Minneapolis, MN 55455, \(^3\)NASA Goddard Space Flight Center, Greenbelt, MD.

Abstract: We describe a Dust Electric Waveform Detector (DEWD) for the LADEE mission. DEWD is flight spare and engineering model hardware from the very successful STEREO/WAVES experiment (S/WAVES), an instrument currently measuring the signatures of interplanetary dust in the heliosphere. The DEWD instrument uses two electric antennas and a waveform ‘snapshot’ receiver to measure the voltage signature of dust impacts on the LADEE spacecraft. This technique has been used spectacularly by the Voyager spacecraft at the outer planets and presently by this very same hardware (S/WAVES) at 1AU in the heliosphere. DEWD measurements will map the spatial distribution of dust around the moon with sensitivity to measure ~0.1 micron and larger particles at very high time resolution. In addition, DEWD measures plasma (Langmuir) waves that will be direct signatures of electron beams energized by electric fields below the spacecraft. The DEWD instrument uses two flight spare (FS) deployable antennas and engineering model (EM) electronics from the NASA S/WAVES experiment. The DEWD development team consists of the key members of the S/WAVES hardware, management, and science team. The DEWD instrument will be integrated and tested in mid-2009 and delivered to NASA in early 2010. All flight and ground software exists, operates currently, and requires only minor modification. The overall S/WAVES instrument is described in Bougeret et al. (2008) (http://tinyurl.com/6xludq) and the antenna system is described by Bale et al. (2008) (http://tinyurl.com/3qfw2z).