Abstract Submitted
for the SHOCK15 Meeting of
The American Physical Society

**Calibration of fiber-optic shock pyrometer using high-power coiled tungsten lamp** O.V. FAT'YANOV, P.D. ASIMOW, Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA 91125 U.S.A. — Comparison of all known calibration sources indicates that coiled standards of spectral irradiance, despite their very non-uniform brightness, are currently the best practical choice for accurate shock temperature measurements above 3000 K by optical pyrometry. We review all three documented methods of shock pyrometer calibration to a coiled lamp and show that only one technique, with no fiber-optics employed, is free of major radiometric errors. We report the development of a new, accurate to 5% and precise to 1-1.5% calibration procedure for the modified Caltech 6-channel, 3-ns temporal resolution combined open beam and fiber-coupled instrument. A designated central area of an 0.7x demagnified image of 900 W coiled-coil lamp filament is used, cross-calibrated against a NIST-traceable tungsten ribbon lamp. The results of two slightly different cross-calibrations are reported and the procedure to characterize the difference between the static and dynamic response of NewFocus 1801 amplified photodetectors. The most essential requirements for error-free calibration of a fiber-optic pyrometer using a coiled irradiance standard lamp are discussed. All these conditions are validated in actual radiometric tests and shock temperature experiments on single-crystal NaCl and MgO.

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Date submitted: 28 Jan 2015 Electronic form version 1.4