Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Upgrade of the Central Laser Facility at the Pierre Auger Observatory and first results CARLOS MEDINA-HERNANDEZ, LAWRENCE WIENCKE, ERIC MAYOTTE, Colorado School of Mines, PIERRE AUGER COLLABORATION — The Pierre Auger Observatory (PAO) explores the nature and origin of cosmic rays with energies above 10^{18} eV. It uses a hybrid technique that combines a Fluorescence Detector (FD) and a 3000 Km^2 surface Detector (SD) array. Two laser test beam facilities are located near the center of the observatory. The Central Laser Facility (CLF) and the eXtreme Laser Facility (XLF) track the atmospheric conditions during FD's operations and perform additional functions. The CLF was upgraded substantially in 2013 with a solid state laser, new generation GPS, robotic beam calibration system, and better thermal and dust isolation. The upgrade also includes a back scatter Raman Lidar receiver, providing an independent measurement the aerosol optical depth (tau(z,t)). We describe the new features, capabilities, and applications of the updated instrument, including, tau(z,t) calculations for atmospheric monitoring using a data normalized method, laser energy calibration, and steered laser firing for arrival directions studies. We also present the first tau(z,t) results after the upgrade,using two using two independent techniques. One method uses the FD's measurements of the CLF's laser shots in bi-static configuration. The other uses the Raman LIDAR in back scattered configuration.

Carlos Medina-Hernandez
Colorado School of Mines

Date submitted: 09 Jan 2015 Electronic form version 1.4