

Abstract Submitted  
for the TSF09 Meeting of  
The American Physical Society

**Plasma On the Rocks: DC Atmospheric-Pressure Normal Glow Plasma Enhanced by Natural Basalt Microdischarges<sup>1</sup>** KARL STEPHAN, School of Engineering, Texas State Univ., SAGAR GHIMIRE, Dept. of Engrg. Technology, Texas State Univ. — DC normal glow discharges at atmospheric pressure in air and other gases are of interest in plasma processing, since they eliminate the need for low-pressure technology and vacuum-compatible materials. We have found that a DC normal glow discharge in air is stabilized and enlarged by passing it through a thickness of low-porosity rock such as basalt or granite. We observe a stable positive column in air up to 15 mm long with stable striations that depend on current. The airborne portion of the discharge shows characteristics of a normal glow discharge, including relatively constant voltage as current varies. A 13-kV, 5 mA discharge between a tungsten electrode 30 mm away from the surface of a basalt sample enlarges to over 15 mm diameter at the surface. We will present still and motion photography, spectra, and I-V measurements of this phenomenon, along with a simplified theory.

<sup>1</sup>Partially supported by grants from the Julian Schwinger Foundation and Texas State University-San Marcos.

Karl Stephan  
School of Engineering, Texas State Univ.

Date submitted: 22 Sep 2009

Electronic form version 1.4