Abstract Submitted
for the TSF12 Meeting of
The American Physical Society

An Aerial "Sniffer Dog" for Methane BRIAN NATHAN, DAVE SCHAEFER, University of Texas at Dallas, MARK ZONDLO, AMIR KHAN, Princeton University, DAVID LARY, University of Texas at Dallas — The Earth's surface and its atmosphere maintain a "Radiation Balance." Any factor which influences this balance is labeled as a mechanism of "Radiative Forcing" (RF). Greenhouse Gas (GHG) concentrations are among the most important forcing mechanisms. Methane, the second-most-abundant noncondensing greenhouse gas, is over 25 times more effective per molecule at radiating heat than the most abundant, Carbon Dioxide. Methane is also the principal component of Natural Gas, and gas leaks can cause explosions. Additionally, massive quantities of methane reside (in the form of natural gas) in underground shale basins. Recent technological advancements–specifically the combination of horizontal drilling and hydraulic fracturing–have allowed drillers access to portions of these "plays" which were previously unreachable, leading to an exponential growth in the shale gas industry. Presently, very little is known about the amount of methane which escapes into the global atmosphere from the extraction process. By using remote-controlled robotic helicopters equipped with specially developed trace gas laser sensors, we can get a 3-D profile of where and how methane is being released into the global atmosphere.

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Date submitted: 20 Sep 2012 Electronic form version 1.4