

Abstract Submitted
for the GEC08 Meeting of
The American Physical Society

Audio frequency modulated RF discharge at atmospheric pressure¹ NICHOLAS BRAITHWAITE, YVONNE SUTTON, DAVID SHARP, The Open University, JON MOORE, B and W Group Ltd — An atmospheric pressure RF arc discharge, generated using a low voltage chopper and a Tesla coil resonant at about 300 kHz, forms a stable, silent, flame-like luminous region some 3 mm in diameter and 40 mm long, rooted to the electrodes by visible hot spots. It is known and we have confirmed that audio frequency modulation of the drive voltage makes the discharge act as an audio loudspeaker (tweeter) with its monopole radiation pattern constrained only by the electrodes. Time resolved ‘total’ optical emission reveals an intensity variation that is synchronous with the audio frequency. Electrical characterisation of the high frequency discharge has been carried out. In the steady state, the high frequency arc burns without generating significant quantities of ozone, as determined by a commercial ozone detector. This is consistent with the high gas temperature within the arc, as measured by optical emission spectroscopy of molecular nitrogen. Phase-locked emission measurements illustrate the acoustic coupling.

¹Project supported by B & W Group Ltd.

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Date submitted: 16 Jun 2008

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