Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

Study of electron avalanches produced by multiphoton ionisation of O_2 using the Pulsed Townsend Technique[1] OLMO GONZÁLEZ-MAGAÑA[2], ANTONIO MARCELO JUAREZ, JAIME DE URQUIJO, National Autonomous University of Mexico — We report the observation of electron swarms using the Pulsed Townsend Technique (PTT), using a 266 nm laser pulse (3 ns) traversing the interelectrode volume and ionising O_2 by multiphoton ionization, thereby generating a cathodeless electron avalanche. The resulting measurements of the electron drift velocity, W, and the density-reduced effective ionisation coefficient, $\alpha_{eff} = (\alpha - \eta)/N$, derived from the measured current are compared those obtained with a "formal" pulsed Townsend experiment in which the initial photoelectrons are produced by a pulse of UV light on the cathode. The W data tie in fairly well with those measured by the "formal" PTT method. Implications of this effect for laser assisted plasma diagnostics and special electron or ion sources will be discussed.

[1]Work partially supported by Projects UNAM-PAPIIT IN 108417 and IA104520, and CONACYT, Project 240073. Thanks are due to A. Bustos, G. Bustos and H. Hinojosa for their technical assistance.
[2]Institute of Physical Sciences (ICF). olmogm@icf.unam.mx

Olmo González-Magaña
National Autonomous University of Mexico

Date submitted: 11 Jun 2020 Electronic form version 1.4