Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Probing many-electron resonances by the positronium formation spectroscopy[1] HIMADRI CHAKRABORTY, Northwest Missouri State University, Maryville, USA, PAUL-ANTOINE HERVIEUX, Universite de Strasbourg, CNRS, Institut de Physique et Chimie des Materiaux de Strasbourg, France — Positronium (Ps) formation studies of atoms, molecules, polymers, solids, liquids, surfaces/films, metal-organic-frameworks and embedded nanostructures are abundant. Our recent calculations [1,2] of Ps formation from fullerene molecules predicted target-geometry dependent diffraction resonances, which are of single-electron character and may be measured by available laboratory technology [3]. The current study, on the other hand, accesses the many-electron resonances, which are known to have been successfully described in photoelectron studies of atoms and fullerenes, by the Ps formation spectroscopy (PsFS). We model the ground state and the many-body linear response of the targets to the positron field by density functional methods [4] and the Ps formation is treated by the continuum distorted-wave final-state approximation [5]. The results, that will be presented, may motivate applications of PsFS to probe resonance signatures. [1] Hervieux *et al.*, *Phys. Rev. A* **95**, 020701 (R) (2017); [2] Hervieux *et al.*, *Phys. Rev. A* **100**, 042701 (2019); [3] Hervieux *et al.*, *Euro. Phys. J. D* **73**, 262 (2019); [4] Choi *et al.*, *Phys. Rev. A* 95, 023404 (2017); [5] Fojon *et al.*, *Phys. Rev. A* **54**, 4923 (1996).

[1]Supported by the National Science Foundation grant PHY-1806206

Himadri Chakraborty
Northwest Missouri State University, Maryville, USA

Date submitted: 30 Jan 2020 Electronic form version 1.4