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Positronium scattering by molecules: free electron gas plus orthogonalizing pseudopotential model[1] R. S. WILDE, Oregon Institute of Technology, I. I. FABRIKANT, University of Nebraska-Lincoln — Experimental total cross sections for scattering of Positronium (Ps) by various atomic and molecular targets are similar to electron scattering cross sections above the Ps ionization threshold[1]. Below the ionization threshold measurements for rare-gas atoms exhibit small cross sections. Previously we used a Free Electron Gas (FEG) model for the exchange and correlation potentials supplemented by an Orthogonalizing Pseudopotential (OPP) to study Ps scattering with rare-gas atoms[2]. In general, we obtained good agreement with experiment, but did not find evidence of a Ramsauer-Townsend minimum. We extend the OPP to non-spherical targets and apply the FEG plus OPP model to calculate elastic scattering cross sections for Ps scattering by the molecular targets H_2, N_2 and CO_2. In previous calculations, using only the FEG potentials for N_2, we found scattering resonances below the ionization threshold[3]. The OPP can take account of the repulsive effect of the Pauli Exclusion Principle which can influence the shape and position of these resonances. [1]S. J. Brawley *et al.*, Science **330**, 789 (2010). [2]R. S. Wilde and I. I. Fabrikant, Phys. Rev. A **98**, 042703 (2018). [3]R. S. Wilde and I. I. Fabrikant, Phys. Rev. A **97**, 052708 (2018).

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