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# Gailitis-Damburg oscillations in scattering of positrons, electrons and muons off (anti)Hydrogen atom

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The Gailitis-Damburg (GD) oscillations are the near threshold singularities of cross-sections of reactive scattering predicted to exist in atomic systems [1, 2, 3]. They are the infinite series of logarithmically spaced maxima and minima of cross-section that can arise above the threshold of excited state of an atom due to the induced dipole interaction between the atom and the spectator particle. Sadly, there is no available experimental data that could confirm or disprove the phenomenon. Only a few recent computational studies of scattering in the positron-antiproton-electron e+e- system devoted to improving the conditions of experiments with antimatter have observed the signs of it [4, 5, 6].

In this regard we present the results of our theoretical study of the behavior of cross sections of low-energy scattering in the systems positron-antiproton-electron e+e-, electron-proton-electron e-pe- and electron-proton-muon pe-. Our model-free computational experiment is based on a solution of the Merkuriev-Faddeev equations in the total orbital momentum representation [7, 8] and the recently obtained original theoretical results on the wave function asymptote for the three-body Coulomb system that takes into account the induced dipole interaction between a free particle and a bound pair of particles [9]. It makes our results including those that are obtained at sufficiently small above threshold energies very reliable. For all the considered atomic systems we have observed the existence of the GD oscillations in the partial cross sections. However, in the total scattering cross sections the oscillations tend to smooth out for the explored processes. We discuss in our talk the opportunity of obtaining the oscillations in the total cross sections in future research. By comparing the results obtained for the e-pe- and pe- systems we discuss the dependence of oscillations on the masses of constituent particles.

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