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Solution of the four-body Coulomb problem by the modified Faddeev-Yakubovsky equations

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Inspired by the Faddeev-Merkuriev approach [1] we have modified the four-body Faddeev-Yakubovsky [2] equations, writing them in a form suitable to solve the four-body Coulomb problem. The newly developed formalism has been applied to study bound and some resonant states in $(Ps)_2$ and \overline{H} -Ps compounds. The first successful attempt to describe low energy Ps-Ps and \overline{H} -Ps scattering has been also realized. The aforementioned systems represent great interest for the experiments with antimatter (like AEGIS, ALPHA or GBAR) carried out at CERN.

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