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Quantum electrodynamics with empty fermion vacuum without "sea" of states with negative energies and with opposite signs of mass summands in Dirac equations for particles and antiparticles. Possibilities of experimental verification.

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We examined versions of quantum electrodynamics (QED) with opposite signs of particle and antiparticle masses in Dirac equations and with empty fermion vacuum without states with negative energies. Application of S-matrix elements of QED versions under consideration leads to complete coincidence of the computational results of physical processes with the appropriate results in the standard QED. In new versions of the theory, there are no virtual processes with creation and annihilation of particle-antiparticle pairs. The processes with vacuum creation of real pairs in intense electromagnetic fields are not available either. The new content of the fermion vacuum (without Dirac sea) in the considered QED versions lead to new physical consequences, a part of which can be experimentally verified in the future either at facilities with exawatt-power optical lasers or in the experiments in collision of heavy ions with the total $Z \geq 170 \div 175$ at the FAIR, HIAF, NICA acceleration centers under construction.

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