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SEMICLASSICAL APPROACH FOR THE DIRAC EQUATION WITH A SPHERICALLY SYMETRIC POTENTIAL

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The model of phenomenon of Stark ionization of relativistic atom in a constant spherically symmetric electric field is investigated. The relativistic WKB-method is employed to consider the semiclassical sub-barrier ionization. An asymptotic behavior of the wave function of the Dirac electron for an atom in a constatnt spherically symmetric electric field is found both in the classically allowed region and in the forbidden region. Using this function, we have calculated the asymptotic leading term of the width of the atomic levels (the probability of ionization) in an electric field and generalized condition of WKB-quantization of Bohr-Sommerfeld on the case of a strong external constant homogenous electric field. The obtained results are discussed and compared with the analogous data of non-relativistic approximations.