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Trojan Wave Packets in the Quantum Cavity within the Extended Jaynes-Cummings Model MATT KALINSKI, Utah State University — Some time ago we have developed the theory of the Trojan Wave Packets (TWP) in the classical strong Circularly Polarized electromagnetic field in terms of the Mathieu generating functions. We have discovered that by the proper partitioning of the Coulomb spectrum i.e. by considering the deviation from the circularity and the vertical tilt of the undressed states as the new quantum numbers we can reduce the problem to the problem of several non-interacting quantum pendula for the Stark-Zeeman field dressed states. The TWP in the infinite physical space however turned out to be weakly unstable due to the spontaneous emission. Here we develop the theory in which the TWP is truly eternal when the electromagnetic interactions are considered quantum and the field is confined by the perfect quantum cavity boundary conditions. First we extend the Jaynes-Cummings (JC) model from the two to the infinite number of levels interacting with the one or two perfectly resonant quantum modes of the electromagnetic field. Similarly the model of JC and our previous pendular model the dressed electron-field eigenstates are constructed within the weakly interacting manifolds. Superpositions of those states are possible with the quantum electron density moving on the circular trajectories.

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