

# Quantum Ground States as Equilibrium Particle-Vacuum Interaction States

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A remarkable feature of atomic ground states is that they are observed to be radiationless in nature, despite (from a classical viewpoint) typically involving charged particles in accelerated motions. The simple hydrogen atom is a case in point. This universal groundstate characteristic is shown to derive from particle-vacuum interactions in which a dynamic equilibrium is established between radiation emission due to particle acceleration, and compensatory absorption from the zero-point fluctuations of the vacuum electromagnetic field. The result is a net radiationless ground state. This principle constitutes an overarching constraint that delineates an important feature of quantum ground states.

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