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PHYSICS DEPARTMENT

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1. The first part of the paper is devoted to a discussion of the general principles of the theory of the interaction of a particle with a field. The author shows that the interaction can be described in terms of a set of coupled equations for the wave functions of the particle and the field. The equations are derived from the Lagrangian of the system and are solved in the case of a free particle and a free field. The results are compared with the results of the classical theory and are found to agree in the limit of large quantum numbers.

2. In the second part of the paper the author considers the case of a particle interacting with a field in the presence of a potential. The potential is assumed to be a function of the position of the particle and is treated as a perturbation. The wave functions are expanded in powers of the potential and the equations are solved order by order. The results are compared with the results of the classical theory and are found to agree in the limit of large quantum numbers.