Variational Method for Few-Body Bound States in QFT J. W.
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cuss a variational method for deriving relativistic few-body equations in QFT. The
method is illustrated on two, three and four body systems in a strongly coupled
model, namely the Scalar Yukawa (Wick-Cutkosky) model, and on QED (the muo-
nium, positronium and muonic hydrogen systems). A reformulation of the models
is employed, in which covariant Green functions are used to solve the field equations
partially, so as to express the mediating field in terms of the particle fields. The
resulting reformulated Hamiltonian of the quantized system thereby contains an in-
teraction term in which the mediating-field Green function is sandwiched between
the particle currents. Numerical solutions of two, three and four body equations are
presented for the scalar Yukawa model for various strengths of the coupling. The re-
sults are compared, where possible, to Bethe-Salpeter based and other calculations.
Perturbative solutions of the two-fermion equations are presented and compared to
other calculations as well as to experimental results for some states of muonium.

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