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**Poincaré invariant calculation of the three-body bound state energy and wave function** M.R. HADIZADEH, CH. ELSTER, Department of Physics and Astronomy and Institute of Nuclear and Particle Physics, Ohio University, Athens, OH 45701, W.N. POLYZOU, Department of Physics and Astronomy, The University of Iowa, Iowa City, IA 52242 — The Faddeev equation for the three-body (3B) bound state of a relativistic mass operator (rest-frame Hamiltonian) is solved directly in terms of momentum vectors without employing a partial wave decomposition. The mass operator is a Casimir operator of a dynamical unitary representation of the Poincaré group, which ensures the exact relativistic invariance of the theory. The input to the calculations are relativistic off-shell two-body transition matrices. They are constructed to be phase-shift equivalent to corresponding non-relativistic two-body transition matrices using the invariance principle and the first resolvent equation. Our numerical results show that relativistic effects, using the Malfliet-Tjon V interaction, reduce the 3B binding energy by about 3.3%. We also compare the structure of the relativistic and corresponding non-relativistic wave functions as a function of the Jacobi momentum vectors.

Mohammadreza Hadizadeh
Department of Physics and Astronomy and Institute of Nuclear and
Particle Physics, Ohio University, Athens, OH 45701

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