

Abstract Submitted
for the APR18 Meeting of
The American Physical Society

A realistic three-dimensional calculation of relativistic nucleon-nucleon interactions MOHAMMADREZA HADIZADEH, Ohio University, MAHDI RADIN, K. N. Toosi University of Technology — The matrix elements of relativistic nucleon-nucleon interaction are calculated directly in terms of momentum vectors, without using a partial wave decomposition. The quadratic operator relation between the relativistic and non-relativistic nucleon-nucleon (NN) interactions is formulated in momentum-helicity basis states. The non-linear relation leads to a single integral equation for total NN spin $s = 0$ and two coupled integral equations for $s = 1$, which are solved by the iteration method. The input for the calculations are non-relativistic nucleon-nucleon interactions and two different models of realistic NN interactions, i.e. Bonn-B and AV18, are used. The numerical tests indicate that the NN observables calculated by the relativistic NN interactions are preserved with high accuracy.

Mohammadreza Hadizadeh
Ohio University

Date submitted: 12 Jan 2018

Electronic form version 1.4