



Contribution ID: 67

Type: Oral Presentation

Alpha particle scattering within the MCAS approach

Thursday, 2 July 2015 09:40 (20 minutes)

Abstract content (Max 300 words) Formatting & Special chars

One of the more effective tools for studying low-energy nucleon-nucleus scattering has been the Multi-Channel Algebraic Scattering (MCAS) method, which solves the coupled Lippmann-Schwinger equations in momentum space. A key aspect of the MCAS approach has been the consistent description of both bound (sub-threshold) and scattering states of the compound system, with a proper handling of the Pauli Principle. The method is not limited to the scattering of nucleons off nuclei, however. We have extended the approach to now include alpha-scattering, which is important in the understanding of nuclear reactions of astrophysical interest. We have also extended the formalism to include heavier mass (sd-shell) targets. Results will be presented for nucleon scattering from ^{18}O and ^{22}Ne , as well as alpha scattering from light targets, eliciting structure information for ^{20}Ne .

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Session Classification: NPRP

Track Classification: Track B - Nuclear, Particle and Radiation Physics