

Abstract Submitted
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Application of Neural Networks to Atomic and Molecular Collisions¹ A.L. HARRIS, Henderson State University, J.A. DARSEY, University of Arkansas at Little Rock — Traditional methods of studying atomic and molecular collisions begin with the classical equations of motion for the particles involved in the system, or the Schrödinger equation. Both of these methods are clearly rooted in the physics of the collision, but they are often computationally difficult and require approximations in order to make the problem tractable. Unlike the traditional methods of studying collision processes, neural networks do not begin with the physics of the problem, but instead employ a semi-empirical method that recognizes patterns in data to make predictions about systems where data is unavailable. Neural networks have been successfully utilized in many different fields, but to our knowledge have never been applied to collision processes. While the premise of a neural network is not based in physics, its output can provide useful data for processes that may be too difficult experimentally or computationally to explore. We will present results from the NNETS neural network code for different collision systems and discuss what role neural networks may play in collision physics.

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