Lagrange Meshes in Nuclear Physics TAYLOR HYNDS, Florida State University — We examine different methods of solving the Schrödinger equation for two and three-body systems. We begin by constructing variational wave functions, as expansions in a basis of orthogonal polynomials. This method has been found to give accurate results, given a sufficiently large basis. However, computationally this can become very cumbersome, and therefore a Lagrange-mesh calculation is used, leading to a simple calculation of both potential and kinetic matrix elements that is both computationally efficient and results in little to no loss in accuracy. This method has been applied to several problems with well-known analytical solutions, and has given excellent results. We demonstrate the effectiveness of this method in analyzing the structure of light nuclei.

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