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Can we describe light nuclei without three body forces? THOMAS WEBER, Iowa State University, ANDREY SHIROKOV, Moscow State University, JAMES VARY, Iowa State University, ALEXANDER MAZUR, SERGEY ZAYTSEV, Khabarovsk State Technical University — We use the J-matrix version of inverse scattering theory to obtain an interaction to be used in the no-core shell model developed by James Vary and others. Through the J-matrix approach we find a representative of the class of Hamiltonians whose members give the same two-body scattering data. Then we preform phase equivalent transformations to find the two body interaction within this class that best describes light nuclei. We obtain excellent results up to ^{6}Li and we expect to get good results up to ^{16}O. We have not explicitly introduced three body forces. But the effect of a three body force in a many body system is reproduced by changes of the off shell properties of the NN interaction.

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