

Abstract Submitted  
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**Can the CDCC calculation be improved?** GEORGE RAWITSCHER, Dept. of Physics., Univ. of Connecticut, Storrs, CT, ISRAEL KOLTRACHT, Dept. of Mathematics, Univ. of Connecticut, Storrs, CT — The Continuum Discretized Coupled Channels method of including breakup effects in the calculation of nuclear reactions, when applied to unstable nuclei, requires the inclusion of a large number of coupled channels, and the numerical computational effort increases correspondingly. The computing time with traditional finite difference techniques [1] scales with the cube of the number of channels  $N$ . The scaling with a new spectral integral method (*SIEM*) [2] of solving coupled equations is likewise  $N^3$ . However, the structure of the matrices that occur in the numerical algorithm of the *SIEM* is different from that of the finite difference methods, and lends itself well to iterative solutions, reducing the numerical complexity to  $N^2$  times the number of required iterations. Various iterative schemes will be considered, and their convergence properties will be examined.

- [1] I. J. Thompson, code FRESCO, Comp. Phys. Rep. **7**, 167 (1988);  
[2] R. A. Gonzales, S. -Y. Kang, I. Koltracht and G. Rawitscher, J. of Comput. Phys. **153**, 160 (1999).

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