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A Linear equation for the Phase Amplitude description of a wave function GEORGE RAWITSCHER, Univ of Connecticut - Storrs — Milne's 1932 non-linear equation for the amplitude of a wave function has now been superseded by a third order linear equation for the square of the amplitude. The advantage of the new equation is that it can be solved non-iteratively by a superposition of Chebyshev polynomials, accurate out to large distances. This method is much simpler to implement than the iterative solution of Milne's equation. It is economical and accurate, and could serve as a starting point for the solution of coupled equations in coordinate space. However, the solution becomes unstable in the vicinity of turning points. Numerical examples for various types of potentials will be presented.

George Rawitscher
Univ of Connecticut - Storrs

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