The Collapsing Solutions of the 1D Quintic Nonlinear Schrödinger Equation

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An introduction to the 1D Quintic Nonlinear Schrödinger Equation and its collapsing solutions is provided. Methods for numerical simulation and tracking of the position of the closest singularity to the real line are discussed. The approach of collapsing solutions to a self-similar solution is examined. Additionally, dynamic remapping techniques using conformal maps are used to drastically improve the efficiency of the simulation. Finally, the use of fitting techniques to estimate the time of collapse and scalings of the self-similar solution is discussed.