

Classification and evolution of an infinite set of lumps solution

Pilar G. Estévez¹ Julia Prada²

May 7, 2007

1. Departamento de Física Fundamental. Universidad de Salamanca. 37008 Salamanca (Spain).
2. Departament de Matemàtiques. Universidad de Salamanca. 37008 Salamanca (Spain).

We present an infinite set of lumps solution [1] for a generalized integrable nonlinear Schrödinger equation in $2 + 1$ dimensions [2], [3], [4], [5]. The solutions have been obtained through the singular manifold method [6]. A classification of these solution and its evolution is described. The connection between this method and the Ablowitz-Villarroel scheme [7], [8], [9], [7] is also analyzed.

References

- [1] Estevez P.G. and Prada J., *Jour. of Physics A: Math and Gen* in press, (2007).
- [2] Shulman E., 1984, *Theor. Math. Phys*, **56**, 720, (1984).
- [3] Fokas A., *Inv. Prob.* **10**, L19-L22, (1994).
- [4] Chakravarty S., Kent S.L. and Newmann T., *J. Math. Phys.* **36**, 763-772, (1995).
- [5] Estevez P.G., *J. Math. Phys.* **40**, 1406-1419, (1999).
- [6] Weiss J., *J. Math. Phys.* **24**, 1405-1413, (1983).
- [7] Ablowitz M. J and Villarroel J., *Physical Review Letters* **78**, 570, (1997).

- [8] Villarroel J. and Ablowitz M.J., *Comm.Math.Phys.* **207** , 1 (1999).
- [9] Ablowitz M.J.,Chakravarty S., Trubatch A.D. and Villarroel J.,
Phys.Lett.A, **267**, 132 (2000).
XV International Conference on Nonlinear Evolution Equations and Dynamical Systems (NEEDS 2001). *Theoretical and Mathematical Physics*, **133**(2-3), 2002.