Contribution ID: **44** Type: **Short talk online (Zoom)**

Multi-Soliton Dynamics of Anti-Self-Dual Gauge Fields

Monday, 22 November 2021 17:15 (15 minutes)

We study dynamics of multi-soliton solutions of anti-self-dual Yang-Mills equations for G = GL(2, C) in four-dimensional spaces. The one-soliton solution can be interpreted as a codimension-one soliton in four-dimensional spaces because the principal peak of action density localizes on a three-dimensional hyperplane. We call it the soliton wall. We prove that in the asymptotic region, the n-soliton solution possesses n isolated localized lumps of action density, and interpret it as n intersecting soliton walls. More precisely, each action density lump is essentially the same as a soliton wall because it preserves its shape and “”velocity”” except for a position shift of principal peak in the scattering process. The position shift results from the nonlinear interactions of the multi-solitons and is called the phase shift. We calculate the phase shift factors explicitly and find that the action densities can be real-valued in three kind of signatures. Finally, we show that the gauge group can be G = SU(2) in the Ultrahyperbolic space U (the split signature (+,+,-,-). This implies that the intersecting soliton walls could be realized in all region in N=2 string theories. It is remarkable that quasideterminants dramatically simplify the calculations and proofs.

Presenter: HUANG, Shan-Chi (Nagoya U)

Session Classification: Short talks