

# On Integrable Hierarchies Associated to Orbit Spaces of Reflection Groups

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Some integrable hierarchies of PDEs (similar to the celebrated KdV) can be reconstructed from geometric data like Frobenius, fl at and bi-fl at F-manifolds. Certain orbit spaces of real (and complex) reflection groups turn out to be equipped with these geometric structures. In this talk, we shed some light on the geometric origin of the nonlinear Schrödinger (NLS) equations.

Generalizing a previous construction, we show that the orbit space of  $B_2$  (after removing a certain locus) is equipped with two Frobenius manifold structures which are related respectively to the defocusing and the focusing nonlinear Schrödinger(NLS) equations.

Motivated by this example, we study the case of  $B_n$  and we show that the defocusing case can be generalized to arbitrary  $n$ . The construction is based on the existence of a non-degenerate and non-constant invariant bilinear form that plays the role of the Euclidean metric in the Dubrovin-Saito standard setting.