

Northeastern University



Mathematics Department

Geometry, Physics, and Representation Theory Seminar

Peter Koroteev

UC Berkeley

Thursday, October 10, 2:50-3:50 pm, Lake Hall 509

q -Operators, QQ -systems, and Bethe ansatz

Abstract

A special case of the geometric Langlands correspondence is given by the relationship between solutions of the Bethe ansatz equations for the Gaudin model and opers - connections on the projective line with extra structure. I shall describe a deformation of this correspondence for $SL(N)$. I will introduce a difference equation version of opers called q -opers and prove a q -Langlands correspondence between nondegenerate solutions of the Bethe ansatz equations for the XXZ model and nondegenerate twisted q -opers with regular singularities on the projective line. The so-called quantum/classical duality between the XXZ spin chain and the trigonometric Ruijsenaars-Schneider model may be viewed as a special case of the q -Langlands correspondence. Some applications of q -opers to the equivariant quantum K-theory of the cotangent bundles to partial flag varieties will be discussed as well as generalizations of our constructions to an arbitrary simply connected complex simple Lie group G .