

Dobrushin Scholarship report (2017)

Vasily Krylov

Publications: • Paper "Integrable crystals and restriction to Levi via generalized slices in the affine Grassmannian" preprint arXiv:1709.00391, to appear in "Functional Analysis and Its Applications".

Annotation: Let G be a connected reductive algebraic group over \mathbb{C} . Let Λ_G^+ be the monoid of dominant weights of G . We construct the integrable crystals $\mathbf{B}^G(\lambda)$, $\lambda \in \Lambda_G^+$, using the geometry of generalized transversal slices in the affine Grassmannian of the Langlands dual group. We construct the tensor product maps $\mathbf{p}_{\lambda_1, \lambda_2}: \mathbf{B}^G(\lambda_1) \otimes \mathbf{B}^G(\lambda_2) \rightarrow \mathbf{B}^G(\lambda_1 + \lambda_2) \cup \{0\}$ in terms of multiplication of generalized transversal slices. Let $L \subset G$ be a Levi subgroup of G . We describe the restriction to Levi $\text{Res}_L^G: \text{Rep}(G) \rightarrow \text{Rep}(L)$ in terms of the hyperbolic localization functors for the generalized transversal slices.

Talks: • "On categorical, geometric and GIT quotients" at Student Seminar at IUM (Moscow, fall 2017)
• "On isomorphisms between quiver varieties of type A and slices in the affine Grassmannian" at Geometry, Physics, and Representation Theory Seminar (Boston, fall 2017)
• "On the Jacobson-Morozov theorem" at the seminar on algebra and model theory (Moscow, spring 2017)
• "Geometric Satake isomorphism" at the seminar on geometric structures on manifolds (Moscow, spring 2017)

Conferences: • "Transformation groups 2017", December 14 - 18, 2017 in Moscow
• "Interactions between Representation Theory and Algebraic Geometry", August 21 - 25, 2017 in Chicago
• "Summer school on algebra and geometry", July 25 - 31, 2017 in Yaroslavl
• "Current topics in the theory of algebraic Groups", July 3 - 7, 2017 in Dijon
• "Geometric Representation Theory", October 10 - 14, 2016 in Kyoto

Teaching assistance: • Algebra 3, HSE
• Lie groups and representation theory, IUM