

BOX SPLINES, AND APPLICATIONS TO REPRESENTATION THEORY

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ABSTRACT. The Zonotope is the Minkowski sum of intervals I_1, I_2, \dots, I_N . It supports a measure called the Box spline.

I will recall a formula inverting the convolution of a function with the Box Spline.

Kirillov formula for the character of an irreducible representation of a compact Lie group uses the Box spline associated to a root system. I will show that the inversion formula, together with Witten "non abelian localisation formula" leads to geometric formulae for multiplicities.

1. OUTLINE OF THE LECTURES

- We recall definitions of the Box Splines and of Bernoulli polynomials in dimension 1. We prove the inversion formula in dimension 1.
- We define multiple Bernoulli polynomials, and prove an inversion formula in multidimensional space.

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We recall Kirillov's character formula for a representation of a compact group associated to a coadjoint orbit, and Witten formula. We show that multiplicities under the maximal Cartan subgroup are determined by the fiber of the moment map. We indicate generalizations.