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THE WEIZMANN INSTITUTE OF SCIENCE  
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE  
Algebraic Geometry and Representation Theory Seminar

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<https://weizmann.zoom.us/j/98304397425>  
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On multiplicativity of gamma-factors and Fourier transforms via Braverman-Kazhdan program

Abstract:

This is a joint work with my student William Sokurski. Braverman-Kazhdan/Ngo program aims to generalize the work of Godement-Jacquet/Tate from  $GL(n)$  to an arbitrary reductive group  $G$  and a finite dimensional representation  $r$  of its  $L$ -group. We briefly review the general concepts of the method, including Renner's construction of reductive  $r$ -monoids, objects generalizing the space of  $n \times n$  matrices in the case of  $GL(n)$ , concluding with the example of symmetric power representations of  $GL(2, \mathbb{C})$ .

We then define a space of  $r$ -Schwartz functions in terms of the restriction of the conjectural  $r$ -Fourier transform to the space of smooth functions of compact support in  $G$ , as in the work of Braverman and Kazhdan. Multiplicativity which states the equality of gamma factors for the parabolically induced and inducing data, follows from a natural commutativity of corresponding Fourier transforms on  $G$  and the Levi subgroup  $L$ , sharing the fixed maximal torus defining the monoid, with a generalized Harish-Chandra transform. We finally present a candidate for the Fourier transform attached to the symmetric cube of  $GL(2, \mathbb{C})$  as a fiber integration over the compact-inducing data for tamely ramified supercuspidals of  $GL(2)$  constructed by Howe and Bushnell-Kutzko, as predicted by Ngo. This last result is part of Sokurski's thesis which can be extended to all the odd symmetric powers.

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