FREE GROUP REPRESENTATIONS: DUPLICITY ON THE BOUNDARY

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Abstract. The starting point of this research is the work of Figà-Talamanca and Picardello:" Spherical functions and harmonic analysis on free groups"[1] where they introduced the principal series representations of a non abelian free group F_r on r generators. These representations can be parametrized on the real interval $[0, \pi/\log(2r-1)]$ and are weakly contained in the regular representation.

Except for those corresponding to the two endpoints, each of them can be realized as acting on L^2 of the boundary ∂F_r in two essentially different ways.

It is important to observe that the behavior of matrix coefficients of endpoint representations is very different from that of interior points.

Here we shall explain how this behavior is related to the existence of two different boundary realizations. Moreover we can prove that there are no identifications beyond the two we started with. It is not necessary to suppose that π is irreducible. Alternative hypotheses, much easier to prove, give irreducibility as a second main conclusion.

References

[1] A. Figà-Talamanca, A. M. Picardello, *Spherical functions and harmonic analysis on free groups* J. Funct. Anal. **47** (1982), 281–304.

[2] W. Hebish, M. G. Kuhn, and T. Steger, *Free group representations: duplicity on the boundary* Preprint: arXiv:1905.03011

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