

ALGEBRA SEMINAR

**Gelfand–Kirillov dimension and mod p cohomology
for GL_2** **Stefano Morra**

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Time: 2:30 pm

Abstract. The Gelfand–Kirillov dimension is a numerical invariant which plays a remarkable role in the classification of complex-valued representations of real and p -adic group.

For instance, for representations of real reductive groups, Vogan showed how the GK dimension is related to the dimension of compact homogeneous spaces where the representation is realized; for representations adelic groups the GK dimension gives information on the vanishing of Fourier coefficients of the corresponding automorphic form.

The mod- p representation theory of p -adic groups is not yet well understood, besides the case of $GL_2(\mathbb{Q}_p)$ (and the rank one groups related to it). The main problem dwells in a poor control of the supercuspidal representations, in that we have a over-abundance of such as compared to the (expected) Langlands parameters.

In analogy to classical local–global compatibility of the Langlands correspondence, it is natural to investigate first the smooth mod p representations of p -adic reductive groups which appears in the mod p cohomology of modular curves.

In this talk we will see that such representations have minimal Gelfand–Kirillov dimension, as in the classical theory, with consequence for the existence of p -adic automorphic forms and modularity lifting results.

This is joint work with C. Breuil, F. Herzig, Y. Hu, B. Schraen.