



UNIVERSIDADE FEDERAL DO RIO DE JANEIRO

INSTITUTO DE MATEMÁTICA

Algebra Seminar

Speaker : Amílcar Pacheco (UFRJ)

Title : Special values of L -functions and motives

Date : May 5, 2016. Time : 17:00. Room : TBA

Abstract. Let k be a number field and $\mathcal{X}$ and $\mathcal{Y}$ smooth, projective, geometrically connected varieties defined over k of dimensions $n \geq m$, respectively. Let $\phi : \mathcal{X} \rightarrow \mathcal{Y}$ be a proper and flat morphism also defined over k . Denote by X its generic fibre, this is a smooth, projective, geometrically connected variety of dimension $d = n - m$ defined over the function field K of $\mathcal{Y}$ over k .

We associate to ϕ a rational function. Its numerator reflects the group of sections and the first cohomology group of $\mathcal{X} \times_k \bar{k}$, as well as the two first cohomology groups relative to ϕ . Denote $f : X \rightarrow \text{Spec}(K) = \eta$ the structural morphism and $j : \eta \hookrightarrow \mathcal{Y}$ the embedding of the generic point. Its denominator reflects the cohomology of the direct image sheaves $j_*((R^j f)_*(\mathbb{Q}_\ell(1)))$, where ℓ is a fixed prime number.

We show that this rational function is indeed the L -function of an Artin motive, more precisely, the Artin motive of the exceptional divisor of ϕ . In a previous work with Hindry and Wazir, we have computed the order of vanishing of this L -function at $s = 1$. In the current joint work with Kahn we obtain the special value of this L -function.