

ISOGENY CLASS OF THE UNIPOTENT PART OF LOGARITHMIC DE RHAM – WITT COHOMOLOGY

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Abstract: Let X/k be a proper smooth variety over a perfect field of characteristic $p > 0$. Illusie introduced the de Rham – Witt complex $W \Omega$ and studied the associated so-called slope spectral sequence in 1970s. The non-degeneracy parts of this spectral sequence are packed into structures known as "dominos", and these dominos give rise to a unipotent subgroup of the logarithmic de Rham – Witt cohomology (or syntomic cohomology) when k is algebraically closed. The sizes of dominos, the domino numbers, were subsequently investigated by Crew and Ekedahl in 1980s, leading to Crew's formula and Ekedahl's inequality. However, the isogeny class of the domino remains unknown in general.

In this talk, for odd p , we present a formula computing the isogeny class of U , the unipotent part of $H^2(A, W \Omega^{1}_{\log})$, for an arbitrary abelian variety A . We then classify all possible isogeny classes of these dominos in the case of abelian threefolds (when p is odd). Furthermore, we provide a formula for the dimension of $U[p]$ in terms of the Ekedahl – Oort type of any principally polarised abelian variety. We can thus describe the p -primary part of the Brauer group of A . This is a joint work with Alexei Skorobogatov and Livia Grammatica.