



CENTRO DE  
**MATEMÁTICA**  
UNIVERSIDADE DO PORTO

GEOMETRY AND TOPOLOGY SEMINAR

# Regulator Maps for Higher Chow Groups via Current Transforms

Pedro Ferreira dos Santos

Instituto Superior Técnico / CAMGSD

**Abstract.** We explain the construction of an explicit regulator map at the level of complexes:

$$\text{Reg}: CH_{\Delta}^p(X, n) \longrightarrow H_{\mathcal{D}}^{2p-n}(X; \mathbb{Z}(p)),$$

from the higher Chow groups of a smooth complex algebraic variety  $X$ , in their simplicial formulation with  $\mathbb{Z}$  coefficients, into integral Deligne-Beilinson cohomology.

We start by using a suitably defined *equidimensional cycles* subcomplex  $\mathcal{Z}_{\Delta, \text{eq}}^p(X, *)$  of Bloch's higher Chow complex  $\mathcal{Z}_{\Delta}^p(X, *)$  to compute the higher Chow groups. This relies on Suslin's *generic equidimensionality* results.

Next, we use algebraic correspondences to introduce transform operations on a fairly general class of currents. Then we combine these transforms with basic properties of equidimensional cycles to construct a map of complexes

$$\text{Reg}: \mathcal{Z}_{\Delta, \text{eq}}^p(X, *) \rightarrow \mathbb{Z}(p)_{\mathcal{D}}(X),$$

where  $\mathbb{Z}(p)_{\mathcal{D}}(X)$  is a complex of currents yielding Deligne-Beilinson cohomology.

FRIDAY, FEBRUARY 15

15H30

ROOM 1.09

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