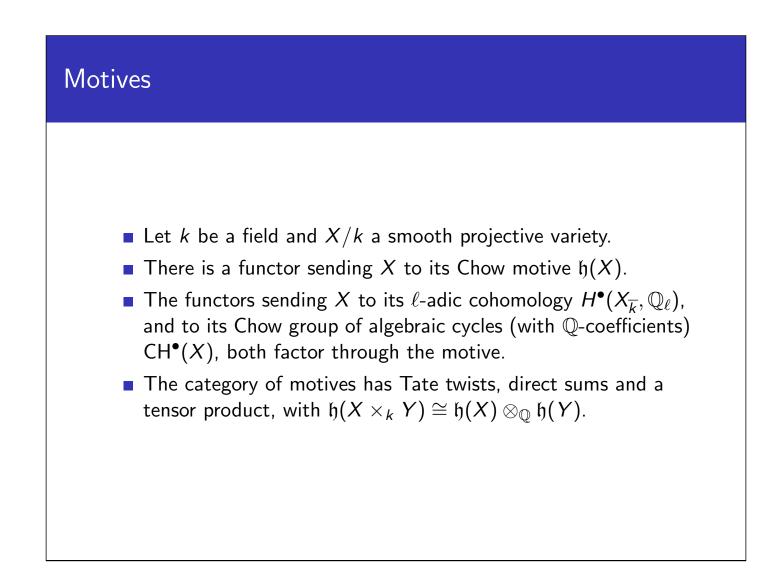
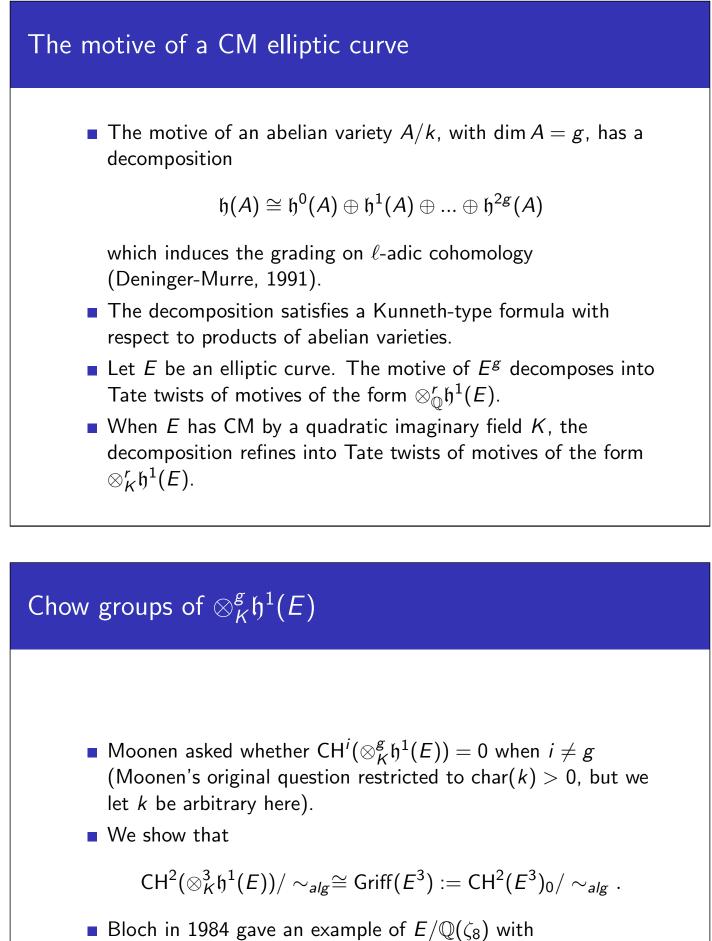
The motive of the *g*-fold product of a CM elliptic curve

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The Mordell conjecture 100 years later MIT, July 8th, 2024





 $Griff(E^3) \neq 0$, so the answer is no over number fields.

Bloch-Beilinson conjecture

Bloch was motivated by

Conjecture

When k is a number field,

$$\dim_{\mathbb{Q}} \mathrm{CH}^{i}(X)_{0} = \mathrm{ord}_{s=i} L(H^{2i-1}(X_{\overline{k}}, \mathbb{Q}_{\ell}), s).$$

- There is also a refined form of the conjecture.
- We pose the same conjecture when k is a global function field.
- For certain X/k, the L-function appearing above can then be computed explicitly.

Motives over function fields

• When E/k has CM, we show that

$$\dim_{\mathbb{Q}} \mathrm{CH}^{i}(E^{g})_{0} \geq \mathrm{ord}_{s=i} L(H^{2i-1}(E^{g}_{\overline{\iota}}, \mathbb{Q}_{\ell}), s).$$

We also show that part of the the refined conjecture holds for E^2 , and the rest of the conjecture for E^2 follows from other standard conjectures about motives.

The conjecture predicts that

$$\dim_{\mathbb{Q}} \mathrm{CH}^{i}(\otimes_{K}^{g} \mathfrak{h}^{1}(E)) = 0$$

for all *i* and all $g \ge 2$, which would affirm Moonen's question in this case.