

- [Return to RatProbAlgTori](#)
- [Return to MultInvField](#)
- [Return to BCAlgTori](#)

## crystcat.gap

### Definition of $M_G$

Let  $G$  be a finite subgroup of  $\mathrm{GL}(n, \mathbb{Z})$ . The  $G$ -lattice  $M_G$  of rank  $n$  is defined to be the  $G$ -lattice with a  $\mathbb{Z}$ -basis  $\{u_1, \dots, u_n\}$  on which  $G$  acts by  $\sigma(u_i) = \sum_{j=1}^n a_{i,j} u_j$  for any  $\sigma = [a_{i,j}] \in G$ .

### Hminus1

▸ `Hminus1(G)`

returns the Tate cohomology group  $\widehat{H}^{-1}(G, M_G)$  for a finite subgroup  $G \leq \mathrm{GL}(n, \mathbb{Z})$ .

### H0

▸ `H0(G)`

returns the Tate cohomology group  $\widehat{H}^0(G, M_G)$  for a finite subgroup  $G \leq \mathrm{GL}(n, \mathbb{Z})$ .

### H1

▸ `H1(G)`

returns the cohomology group  $H^1(G, M_G)$  for a finite subgroup  $G \leq \mathrm{GL}(n, \mathbb{Z})$ .

### CrystCatQClass, CrystCatQClassCatalog, CrystCatQClassNumber

▸ `CrystCatQClass(G)`

▸ `CrystCatQClassCatalog(G)`

▸ `CrystCatQClassNumber(G)`

returns the CrystCat ID ( $\mathbb{Q}$ -class) of  $G$  for a finite subgroup  $G \leq \mathrm{GL}(n, \mathbb{Z})$ . For CrystCat ID, see [[HY17](#), Chapter 3].

### CrystCatZClass, CrystCatZClassCatalog, CrystCatZClassNumber

▸ CrystCatZClass( $G$ )

▸ CrystCatZClassCatalog( $G$ )

▸ CrystCatZClassNumber( $G$ )

returns the CrystCat ID ( $\mathbb{Z}$ -class) of  $G$  for a finite subgroup  $G \leq \mathrm{GL}(n, \mathbb{Z})$ .  
For CrystCat ID, see [HY17, Chapter 3].

## References

[HY17] Akinari Hoshi and Aiichi Yamasaki, Rationality problem for algebraic tori, Mem. Amer. Math. Soc. **248** (2017) no. 1176, v+215 pp. [AMS Preprint version: arXiv:1210.4525](#).

[HKY23] Akinari Hoshi, Ming-chang Kang and Aiichi Yamasaki, Multiplicative Invariant Fields of Dimension  $\leq 6$ , Mem. Amer. Math. Soc. **283** (2023) no. 1403, vi+137 pp. [AMS Preprint version: arXiv:1609.04142](#).

[HY] Akinari Hoshi and Aiichi Yamasaki, Birational classification for algebraic tori, [arXiv:2112.02280](#).

Copyright © 2012 Akinari Hoshi, Aiichi Yamasaki