- [Return to MultInvField]

res.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 $\{u_1,\ldots,u_n\}$ on which G acts by $\sigma(u_i)=\sum_{j=1}^n a_{i,j}u_j$ for any $\sigma=[a_{i,j}]\in G$.

ResH2

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‣ ResH2(G,H)
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returns the record r=(H2G, H2Ggen, H2H, H2Hgen, ResMat) where H2G is the abelian invariants of $H^2(G,M_G)$, i.e. AbelianInvariants($H^2(G,M_G)$), H2Ggen is the list of generators of $H^2(G,M_G)$, H2H is the abelian invariants of $H^2(H,M_H)$, i.e. AbelianInvariants($H^2(H,M_H)$), H2Hgen is the list of generators of $H^2(H,M_H)$, ResMat is the representation matrix of the restriction map $\mathrm{res}: H^2(G,M_G)\to H^2(H,M_H)$ for a finite subgroup $G\leq \mathrm{GL}(n,\mathbb{Z})$ and subgroup $H\leq G$. When $H^2(G,M_G)=0$ or $H^2(H,M_H)=0$, error occurs.

H2nrM

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‣ H2nrM(G)
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returns the record r=(H2G, H2Ggen, H2nrM, H2nrMgen) where H2G is the abelian invariants of $H^2(G,M_G)$, i.e. AbelianInvariants($H^2(G,M_G)$), H2Ggen is the list of generators of $H^2(G,M_G)$, H2nrM is the abeliants of a direct factor $H^2_{\mathrm{nr}}(G,M_G)$ of the unramified Brauer group $\mathrm{Br}_{\mathrm{nr}}(\mathbb{C}(M)^G)$, i.e. AbelianInvariants($H^2_{\mathrm{nr}}(G,M_G)$), which is defined to be

$$H^2_{\mathrm{nr}}(G,M_G)=\bigcap_A \mathrm{Ker}(\mathrm{res}: H^2(G,M)\to H^2(A,M))$$

where A runs over all the bicyclic subgroups of G, H2nrMgen is the list of generators of $H^2_{\mathrm{nr}}(G,M_G)$ for a finite subgroup $G\leq \mathrm{GL}(n,\mathbb{Z})$. When $H^2(G,M_G)=0$, error occurs.

References

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