

Zeitschrift: L'Enseignement Mathématique
Herausgeber: Commission Internationale de l'Enseignement Mathématique
Band: 22 (1976)
Heft: 1-2: L'ENSEIGNEMENT MATHÉMATIQUE

Artikel: FINITE GEOMETRIES IN THE THEORY OF THETA CHARACTERISTICS
Autor: Rivano, Neantro Saavedra

Bibliographie
DOI: <https://doi.org/10.5169/seals-48185>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. [Siehe Rechtliche Hinweise.](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. [Voir Informations légales.](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. [See Legal notice.](#)

Download PDF: 18.01.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

It follows from the last part of prop. 3.2.1 that, in this case, the number of odd characteristics in the fundamental sets is congruent to $g \pmod{4}$. We will see that this is a general fact.

4.5.1 PROPOSITION. *Let $O(F)$ be the number of odd characteristics in a fundamental set F . Then $O(F) \equiv g \pmod{4}$. Conversely, for any $l \equiv g \pmod{4}$, and $l \leq 2g + 2$, there are fundamental sets F with $O(F) = l$.*

4.5.2 Proof. We may safely restrict ourselves to the case where the symplectic torsor is S_X with its standard basis X , and $F = \{A\} + (X \cup \{X\})$ where $A \subset X$ is of even order $|A| = 2k$ (cf. 4.3). Then, in F there are $2k$ characteristics corresponding to subsets of X with $2k - 1$ elements, $2(g - k) + 1$ characteristics with $2k + 1$ elements, and 1 characteristic with $2(g - k) + 1$ elements, namely the ones obtained adding A to respectively the characteristics of the form $\{s\}$ ($s \in A$), $\{s\}$ ($s \notin A$), X . When g is even the second and third types have the same parity; when g is odd the first and third types have the same parity. From these remarks, it is easy to see that the number of elements of the same parity in F and $X \cup \{X\}$ are congruent mod 4, and that with this only restriction, this number can be arbitrary for F by conveniently choosing A . The proposition follows from this and from what was said just before its statement.

4.5.3 In Coble [1], additional material on fundamental sets may be found.

REFERENCES

- [1] COBLE, A. An application of finite geometry to the characteristic theory of the odd and even theta functions. *Trans. A.M.S.* 7 (1906), pp. 241-276.
- [2] FAY, J. Theta functions on Riemann surfaces. *Lecture Notes in Mathematics*, No. 352, Springer Verlag (1973).
- [3] IGUSA, J. *Theta Functions*. Springer Verlag (1972).
- [4] MUMFORD, D. On the equations defining Abelian varieties I. *Invent. Math.* 1 (1966), pp. 287-354.
- [5] ——— Theta characteristics of an algebraic curve. *Ann. Scient. ENS* 4 (1971), pp. 181-192.
- [6] WEBER, H. *Lehrbuch der algebra*, Band 2, Braunschweig (1896).

(Reçu le 20 février 1976)

Neantro Saavedra Rivano

Dept. de Matemática
 Universidad Simón Bolívar
 Apartado 5354
 Caracas, Venezuela