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Congruences for Brewer sums. (English) Zbl 1107.11032
Finite Fields Appl. 13, No. 1, 1-19 (2007).

The Brewer sums considered here are

$$\Lambda_n(a) = \sum_{x=0}^{p-1} L(D_n(x, a), p),$$

where p is a prime, L is the Legendre symbol and $D_n(x, a)$ is the n th order Dickson polynomial of the first kind. $\Lambda_n(a)$ is easily seen to be 0 when $(n, p^2 - 1) = 1$ or $p \equiv 3 \pmod{4}$. The author considers the case where $p \equiv 1 \pmod{4}$, n is an odd prime dividing $p^2 - 1$ and determines which $\Lambda_n(a)$ are 0. The proof uses explicit factorizations of the Dickson polynomials over finite fields.

Reviewer: [Robert Fitzgerald \(Carbondale\)](#)

MSC:

- [11L10](#) Jacobsthal and Brewer sums; other complete character sums
- [11T06](#) Polynomials over finite fields
- [12Y05](#) Computational aspects of field theory and polynomials (MSC2010)

Cited in **1** Review
Cited in **4** Documents

Keywords:

[Brewer sums](#); [Dickson polynomials](#); [finite fields](#)

Full Text: [DOI](#)

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