Title: A superelliptic equation involving alternating sums of powers

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In this short note, we solve completely the Diophantine equation

$$1^k - 3^k + 5^k - \cdots + (4x-3)^k - (4x-1)^k = -y^n,$$

for $3 \leq k \leq 6$. This may be viewed as a "character-twisted" analogue of a classic equation of Schaffer (in which context, it was previously considered by Dilcher). In our proof, we appeal primarily to techniques based upon the modularity of Galois representations and, in particular, to a combination of these ideas with suitable local information.

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