Slim Exceptional Sets for Sums of Cubes
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Abstract. We investigate exceptional sets associated with various additive problems involving sums of cubes. By developing a method wherein an exponential sum over the set of exceptions is employed explicitly within the Hardy-Littlewood method, we are better able to exploit excess variables. By way of illustration, we show that the number of odd integers not divisible by 9, and not exceeding $X$, that fail to have a representation as the sum of 7 cubes of prime numbers, is $O(X^{23/36 + \varepsilon})$. For sums of eight cubes of prime numbers, the corresponding number of exceptional integers is $O(X^{11/36 + \varepsilon})$. 

Received by the editors March 27, 2001; revised August 2, 2001.
The author is a Packard Fellow, and was supported in part by NSF grant DMS-9970440.
AMS subject classification: 11P32, 11P05, 11P55.
Keywords: Waring’s problem, exceptional sets.