1116-05-270 **Mitchell M Lee***, mitchlee@mit.edu. *Sets with few differences in abelian groups.*

Let $(G, +)$ be an abelian group. In 2004, Eliahou and Kervaire found an explicit formula for the smallest possible cardinality of the sumset $A + A$, where $A \subseteq G$ has fixed cardinality r. We consider instead the smallest possible cardinality of the difference set $A - A$, which is always greater than or equal to the smallest possible cardinality of $A + A$ and can be strictly greater. We conjecture a formula for this quantity, and prove the conjecture in the case that G is a cyclic group or a vector space over a finite field. This resolves a conjecture of Bajnok and Matzke on signed sumsets. (Received August 19, 2015)