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Essential components. (English) [Zbl 0609.10042](#)
[Proc. Lond. Math. Soc., III. Ser. 54, 38-56 \(1987\).](#)

The author calls a set H of nonnegative integers an essential component if $\underline{d}(A+H) > \underline{d}(A)$ for any set A with $\underline{d}(A) < 1$. (Here \underline{d} denotes lower asymptotic, not Schnirelman density!). It is proved by probabilistic methods that there exist, for every $\epsilon > 0$, essential components satisfying $H(x) = O(\log^{1+\epsilon} x)$. Furthermore, it is shown that, for any essential component H , there exist numbers $c > 0$ and x_0 such that $H(x) > \log^{1+\epsilon} x, \forall x > x_0$. One of the main tools is a characterization of essential components in terms of additive behavior modulo m ($m = 1, 2, \dots$).

Reviewer: [B.Volkman](#)

MSC:

- [11B05](#) Density, gaps, topology
- [11B13](#) Additive bases, including sumsets
- [11K99](#) Probabilistic theory: distribution modulo 1; metric theory of algorithms
- [11P55](#) Applications of the Hardy-Littlewood method
- [11B83](#) Special sequences and polynomials

Cited in **2** Reviews
Cited in **5** Documents

Keywords:

[sum-sets](#); [sets of integers](#); [asymptotic density](#); [trigonometric sums](#); [essential component](#)

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