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On the speed of convergence in the strong density theorem. (English) Zbl 1426.26004

Real Anal. Exch. 44, No. 1, 167-180 (2019); corrigendum *ibid.* 45, No. 2, 487-488 (2020).

This work constitutes a contribution to Problem 146 of Ulam and Erdős's Scottish Book problems [*R. D. Mauldin*, *The Scottish Book. Mathematics from the Scottish Café. With selected problems from the New Scottish Book.* 2nd updated and enlarged edition. Cham: Birkhäuser/Springer (2015; [Zbl 1331.01039](#))], on how fast the ratio in the strong density theorem of Saks will tend to one. Under some technical conditions, one has:

$$\frac{|R \cap K|}{|R|} > 1 - o\left(\frac{1}{|\log d(R)|}\right) \text{ for a.e. } x \in K \text{ and as } d(R) \rightarrow 0,$$

where K is a compact set in \mathbb{R}^n , R is an interval in \mathbb{R}^n , d stands for the diameter, and $|\cdot|$ is the Lebesgue measure.

Reviewer: [George Stoica \(Saint John\)](#)

MSC:

[26A12](#) Rate of growth of functions, orders of infinity, slowly varying functions

[28A05](#) Classes of sets (Borel fields, σ -rings, etc.), measurable sets, Suslin sets, analytic sets

[40A05](#) Convergence and divergence of series and sequences

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Keywords:

speed of convergence; Besicovitch-Taylor index; Saks' strong density theorem

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