Dynamical Systems Seminar

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Borel-Cantelli sequences

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646 PGH

Abstract

Definition. *A sequence* $\{x_1, x_2, ...\}$ *in* $[0, 1)$ *is called Borel-Cantelli (BC) if given a monotonic (decreasing) sequence* $a_1, a_2, ...$ *of positive real numbers such that* $\sum_{i=1}^{\infty} a_i = \infty$ *then*

$$\text{Leb}(\bigcap_{k=1}^{\infty} \bigcup_{n=k}^{\infty} B(x_n, a_n)) = 1.$$

That is, almost every point in $[0, 1)$ *appears in infinitely many balls of radius* a_i *about* x_i.

This talk will focus on Borel-Cantelli sequences, which are sequences where a natural converse to the Borel-Cantelli Theorem holds. It is motivated by the Monotone Shrinking Target Property, but approaches the problem from a geometric rather than dynamical perspective. A sufficient condition, a necessary condition and a necessary and sufficient condition for a sequence to be Borel-Cantelli will be presented. Using these conditions some sequences will be shown to be/not be Borel-Cantelli. This is joint work with Michael Boshernitzan.

For future talks or to be added to the mailing list, please visit
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