THE BETA(p,1) EXTENSIONS
OF THE RANDOM (UNIFORM) CANTOR SETS

Dinis D. Pestana

FCUL, DEIO and CEAUL, Universidade de Lisboa
Campo Grande, Edifício C4, 1749–016 Lisboa, Portugal

e-mail: dinis.pestana@fc.ul.pt

AND

Sandra M. Aleixo, J. Leonel Rocha

Mathematics Unit, DEC, DEQ,
Instituto Superior de Engenharia de Lisboa and CEAUL
Rua Conselheiro Emídio Navarro, 1, 1949–014 Lisboa, Portugal

e-mails: sandra.aleixo@dec.isel.ipl.pt; jrocha@deq.isel.ipl.pt

Dedicated to Professor J. Tiago Mexia on his 70th birthday

Abstract

Starting from the random extension of the Cantor middle set in [0,1], by iteratively removing the central uniform spacing from the intervals remaining in the previous step, we define random Beta(p,1)-Cantor sets, and compute their Hausdorff dimension. Next we define a deterministic counterpart, by iteratively removing the expected value of the spacing defined by the appropriate Beta(p,1) order statistics. We investigate the reasons why the Hausdorff dimension of this deterministic fractal is greater than the Hausdorff dimension of the corresponding random fractals.

Keywords: order statistics, uniform spacings, random middle third Cantor set, Beta spacings, Hausdorff dimension.

2000 Mathematics Subject Classification: 60E05, 26A30.
References


Received 6 October 2009