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Stéphane Jaffard*, Department of Mathematics, University Paris 12, 61, Avenue du Général de Gaulle, 94010 Créteil, France. *Multifractal Analysis of Functions Arising in Number Theory*.

We will consider several kinds of real functions which are all related with arithmetic and share common features, but appeared in different contexts: They will include Davenport series (one-periodic functions with jumps at rational numbers), and also functions obtained as limits of “digital functions”. Their Hölder regularity at a point depends on the Diophantine (or p -adic) approximation properties of the point; we will perform the multifractal analysis of these functions, i.e. determine the Hausdorff dimensions of the sets of points where they have a given Hölder regularity. Finally we will show a connexion between properties of Davenport series and questions related with the Riemann hypothesis. (Received February 24, 2006)