Periodic and Almost Periodic Functions on Infinite Sierpinski Gaskets

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Abstract. We define periodic functions on infinite blow-ups of the Sierpinski gasket as lifts of functions defined on certain compact fractafolds via covering maps. This is analogous to defining periodic functions on the line as lifts of functions on the circle via covering maps. In our setting there is only a countable set of covering maps. We give two different characterizations of periodic functions in terms of repeating patterns. However, there is no discrete group action that can be used to characterize periodic functions. We also give a Fourier series type description in terms of periodic eigenfunctions of the Laplacian. We define almost periodic functions as uniform limits of periodic functions.

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