Title: Functional analysis behind a family of multidimensional continued fractions. Part I

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Triangle partition maps form a family that includes many, if not most, well-known multidimensional continued fraction algorithms. This paper begins the exploration of the functional analysis behind the transfer operator of each of these maps. We show that triangle partition maps give rise to two classes of transfer operators and present theorems regarding the origin of these classes; we also present related theorems on the form of transfer operators arising from compositions of triangle partition maps. In the next paper, Part II, we will find eigenfunctions of eigenvalue 1 for transfer operators associated with select triangle partition maps on specified Banach spaces, and then proceed to prove that the transfer operators, viewed as acting on one-dimensional families of Hilbert spaces, associated with select triangle partition maps are nuclear of trace class zero. We will finish in Part II by deriving Gauss–Kuzmin distributions associated with select triangle partition maps.

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