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**David Ralston\*** (ralstond@oldwestbury.edu), Department of Mathematics, SUNY College at Old Westbury, PO 210, Old Westbury, NY 11568. *Symbolic Dynamics and the Infinite Staircase.*

We will present a dynamically-determined sequence of substitutions which encode a skew product  $T_\alpha : \mathbb{S}^1 \times \mathbb{Z} \rightarrow \mathbb{S}^1 \times \mathbb{Z}$  defined by

$$T_\alpha(x, n) = (x + \alpha \bmod 1, n + f(x)),$$

where  $\alpha \notin \mathbb{Q}$  is given, and

$$f(x) = \begin{cases} 1 & (0 \leq x \leq 1/2) \\ -1 & (1/2 < x < 1). \end{cases}$$

This skew product is a cross-section of the geodesic flow on a particular translation surface of infinite measure and genus known as the *infinite staircase*.

Through explicit analysis of the substitutions as well as dynamic properties of the process which generates them, we may deduce properties about the geodesic flow, such as generic diffusion rates, certain  $\alpha$  which give rise to explicit abnormal diffusion rates, and the existence of transient (non-recurrent) orbits for all  $\alpha$ . (Received September 13, 2013)