

The most frequent^{ly} employed example of non^{linear} 2-dimensional map, the "E. Coli" of non^{linear} dynamics^s is the Hénon map:

$$x_{n+1} = 1 - ax_n^2 + by_n$$

$$y_{n+1} = x_n$$

It is sometimes written equivalently as the 2-step recurrence relation

$$x_{n+1} = 1 - a|x_n| + by_n$$

$$y_{n+1} = x_n$$

The [Lozi] map^s is a linear tent map version of the Hénon map^s given by

$$x_{n+1} = 1 - ax_n^2 + bx_{n-1}$$

Al^{tho}ugh it is not realistic as an approximation to a smooth flow, the Lozi map is a very helpful tool for developing intuition about the topology of an entire class of maps of the Hénon type, so called once-folding maps.

The Hénon map is the simplest map that captures the "stretch & fold" dynamics of return maps such as the Rössler's. The Hénon map dynamics is conveniently plotted in the (x_n, x_{n+1}) plane, an example is given in fig. 2.

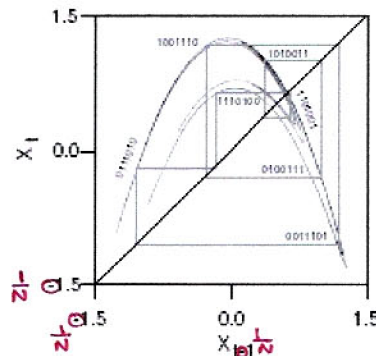


Fig. 2: The strange attractor (unstable manifold) and a period 7 cycle of the Hénon map; $a=1.4$, $b=0.3$.