# The Ledrappier - Young formula for diagonal self-affine iterated function systems

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## Abstract

Ledrappier and Young gave a formula for the Hausdorff dimension of the invariant measures of smooth diffeomorphisms on Riemann manifolds. Feng, Hu extended this formula to the diagonal self-affine iterated function systems. This paper is set to expound this formula, represent the main ideas of the proof, and give a better understanding about this topic.

In the first half of the thesis we are going to show some classic result in the theory of fractal dimensions, to emphasize the importance of our main theorem. We give formulas for the Hausdorff dimension of self-affine fractals, assuming some separation conditions. The dimension in overlapping cases will be mentioned only for self-similar fractals.

After that we show how the Ledrapper-Young formula works on an example, introduce the projection entropy, and finally proof the Theorem of Feng, Hu.