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Gainesville, FL 32611. *Entropy Efficiency of Braids*. Preliminary report.

A braid  $\beta$  is said to have entropy  $h(\beta)$  if that is the least topological entropy of all homeomorphisms of the disk which have a collection of periodic orbits corresponding to the braid. The braid entropy may be computed using the Thurston-Nielsen Theory. The *maximal entropy efficiency* of a finite set of braids,  $\{\alpha_1, \dots, \alpha_k\}$ , is the maximum possible entropy per unit  $\alpha_i$  of braid words made from the  $\alpha_i$ , or

$$\sup_{m \in \mathbb{N}} \left\{ \frac{h(\alpha_{i_1} \dots \alpha_{i_m})}{m} : 1 \leq i_j \leq k \right\}.$$

The terminology comes from fluid mixing where the  $\alpha_i$  correspond to simple motions of stirring rods, and the entropy of the braid gives a rough measure of how well the corresponding rod motion mixes. Thus one seeks stirring protocols with maximum mixing per simple rod motion. We discuss results on entropy efficiency for various sets of braids. (Received February 14, 2010)