

## STATISTICAL STABILITY FOR MULTI-SUBSTITUTION TILING SPACES

HELDER VILARINHO

Universidade da Beira Interior

Roughly speaking, a *tiling* is an arrangement of tiles that covers  $\mathbb{R}^d$  without overlapping. An important class of tilings is that of *self-similar tilings*. In order to construct a self-similar tiling, one starts with a finite number (up to translation) of tiles and a *substitution map* that determines how to inflate and subdivide these tiles into certain configurations of the same tiles. Increasingly larger patches of such tilings can be obtained by applying consecutively the substitution map to some initial tile.

In this talk we deal with *multi-substitution tiling spaces*, determined by a finite set  $\mathcal{S}$  of substitution maps, acting on a finite set of tiles, and a sequence of substitution maps in  $\mathcal{S}$  that determines which substitution (inflation/subdivision) is made in each step. We consider dynamical systems given by the continuous action of translations on a multi-substitution tiling space and prove that those systems have a unique ergodic probability measure, which is closely related with the patch frequencies. Moreover, we prove that the ergodic limits of patch frequencies vary continuously with the sequence of substitutions and we also give some results on mixing properties for multi-substitution dynamical systems.

This is a joint work with Rui Pacheco.