

Diagonal changes on translation surfaces

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We describe a geometric algorithm that generalizes the classical continued fraction algorithm for the torus to all translation surfaces in hyperelliptic components of strata. The elementary moves of the algorithm consist of diagonal changes in special quadrangulations of the given surface. We show that diagonal changes algorithms produce all saddle connections which are best approximations in a geometric sense. Furthermore, they can be used to produce a list of systoles along a Teichmueller geodesics and to enumerate pseudo-Anosov mapping classes. Diagonal changes also provide a geometric realization of the natural extension of the renormalization introduced by S. Ferenczi and L. Zamboni for the corresponding interval exchange transformations. This is joint work with Vincent Delecroix.