Minimizing lengths of two intersecting simple closedgeodesics

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Abstract. We address the problem proposed recently by T. Gauglhofer and H. Parlier on finding out the minimum of the longer of the lengths of a pair of simple closed geodesics on a hyperbolic torus where the hyperbolic torus runs over its moduli space with fixed boundary data and the pair of simple closed geodesics intersect k times for a fixed k.

We have found a new phenomenon that for different types of slope pairs, one minimum may dominate the other for arbitrary boundary data.