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Moira Chas* (moira@math.sunysb.edu), Department of Mathematics, Stony Brook University, Stony Brook, NY 11794, **Anthony V. Phillips**, NY , and **Steve Lalley**, NY. *Structures related to intersection of curves on surfaces.*

Consider the set of free homotopy classes of oriented closed curves on a surface. This is the set of equivalence classes of maps from the circle into the surface, where two such maps are equivalent if the corresponding directed curves can be deformed one into the other. There is a canonical bijection from this set to the set of conjugacy classes of the fundamental group of the surface.

Given a free homotopy class one can ask what is the minimum number of times, counted with multiplicity, a curve in that class intersects itself. We study how this minimal self-intersection number may vary with the word length. (The word length is the minimal number of letters required for a description of the class in terms of the standard generators of the fundamental group and their inverses.)

In these talk, several problems (and some solutions) related to minimal self-intersection will be discussed. We will address such questions as: the possible maximal self-intersection for a given length, the number of conjugacy classes with given self-intersection and given length, distribution of the number of classes given self-intersection and length.

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