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COMPUTATION OF NIELSEN AND REIDEMEISTER COINCIDENCE NUMBERS FOR MULTIPLE MAPS

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Abstract. Let $f_1, \ldots, f_k \colon M \to N$ be maps between closed manifolds, $N(f_1, \ldots, f_k)$ and $R(f_1, \ldots, f_k)$ be the Nielsen and the Reideimeister coincidence numbers, respectively. In this note, we relate $R(f_1, \ldots, f_k)$ with $R(f_1, f_2), \ldots, R(f_1, f_k)$. When N is a torus or a nilmanifold, we compute $R(f_1, \ldots, f_k)$ which, in these cases, is equal to $N(f_1, \ldots, f_k)$.

1. Introduction

A central problem in classical Nielsen coincidence theory is the computation of the Nielsen coincidence number $N(f, g)$ for two maps $f, g \colon M \to N$ between two closed orientable manifolds of the same dimension. Moreover, the classical Reidemeister number $R(f, g)$ is an upper bound for $N(f, g)$.

In [16], P.C. Staecker stablished a theory for coincidences of multiple maps called *Nielsen equalizer theory*: given k maps $f_1, \ldots, f_k \colon M^{(k-1)n} \to N^n$ between compact manifolds of dimension $(k-1)n$ and n, respectively, a Nielsen number $N(f_1, \ldots, f_k)$ is defined such that it is a homotopy invariant and a lower bound for the cardinality of the sets

$$\mathrm{Coin}\big(f'_1, \ldots, f'_k\big) = \{x \in M \mid f'_1(x) = \ldots = f'_k(x)\},$$

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