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COBORDISM GROUPS OF IMMERSIONS WITH RESTRICTED SELF-INTERSECTION

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0. Introduction. An l-immersion is an immersion without $(l+1)$-tuple points. An immersion is called *completely regular* if its self-intersections are transversal. In 1971, F. Uchida defined the *cobordism group of l-immersions* as follows, (see [14]).

DEFINITION 0.1. A completely regular l-immersion $f: M^n \to N^{n+k}$ is *cobordant to zero* if there exists an immersion $F: V \to W$ where:

(1) V and W are compact, C^∞-differentiable manifolds of dimensions $n+1$ and $n+k+1$ respectively, and

(2) $F: V \to W$ is a completely regular l-immersion such that $(F|\partial V, \partial V, \partial W) = (f, M, N)$.

Two completely regular l-immersions (f_0, M_0, N_0) and (f_1, M_1, N_1) will be said to be *cobordant* if and only if the disjoint union $(f_0, M_0, N_0)+(-f_1, -M_1, -N_1)$ is cobordant to zero.

Let $C^0(n, k; l)$ denote the set of cobordism classes of completely regular l-immersions of dimensions $\dim M_i = n$, $\dim N_i = n+k$. As usual an abelien group structure is imposed on $C^0(n, k; l)$ by disjoint union.

We shall call these groups the *oriented Uchida groups*. Uchida investigated these groups by geometrical methods. We first reduce the computation of the groups $C^0(n, k; l)$ to algebraic topology and subsequently we compute the ranks of these groups.

Uchida proved that for the non-orientable version of his groups the natural map $C(n, k; l) \to C(n, k; l+1)$ is a monomorphism. We prove that this holds for the oriented Uchida groups as well. We shall proceed as follows. In Section 1 we describe a space $\Gamma_l(k)$. In Section 2 we show that the bordism groups of this space are isomorphic to the groups $C^0(n, k; l)$. In Section 3 we compute the ranks of the bordism groups of $\Gamma_l(k)$. Before closing the introduction, we give some remarks.

REMARK 0.2. The groups $C^0(n, k; l)$ for $l=\infty$ were considered earlier by Schweitzer [Sc]. He proved that these groups are isomorphic to the bor-