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ISOMORPHIC COMPLEXES

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In this paper we show that if K and L are n-complexes, then K and L are isomorphic iff the 1-sections of the first derived complexes of K and L are isomorphic. This provides a low-dimensional method for establishing the isomorphism (homeomorphism) of complexes (polyhedra).

Throughout, s_p will denote a (rectilinear) p-simplex with vertices $a^0, a^1, \cdots, a^p$; K will denote a (finite geometric) complex with n-section K^n and first derived complex K'. The *closed star* of a vertex a of K, $\mathrm{st}(a)$, is the set of simplexes of K having a as a face and all their faces. For more details see [2].

DEFINITION 1. An n-complex K is *full* provided, for any subcomplex L of K which is isomorphic to s_p^1, $2 \leqq p \leqq n$, L^0 spans a p-simplex of K.

THEOREM 1. *Suppose K and L are full n-complexes. Then K and L are isomorphic iff K^1 and L^1 are isomorphic.*

PROOF. We need only consider the case when K^1 and L^1 are isomorphic. Let $v: K^1 \to L^1$ be an admissible vertex transformation of K^1 onto L^1 with an admissible inverse. Then a^0, a^1 span a 1-simplex of K iff $v(a^0)$, $v(a^1)$ span a 1-simplex of L. Furthermore, for any p, $2 \leqq p \leqq n$, if $a^0, a^1, \cdots, a^p$ span a p-simplex s_p of K, then $v[s_p^1]$ is isomorphic to s_p^1. So, using the fullness of L, we get that $(v[s_p^1])^0$