

On the uniqueness of the decomposition of manifolds, polyhedra and continua into cartesian products

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Abstract. Generally the uniqueness of the decomposition of topological spaces into Cartesian product does not hold. We have very simple examples. The Cartesian product of a disc with two holes and an interval and the Cartesian product of a torus with one hole and an interval are homeomorphic.

However, the uniqueness of the decomposition holds in some cases. In 1938 K.Borsuk showed that the decomposition of a polyhedron into Cartesian product of 1-dimensional factors is unique.

I will consider the uniqueness of the Cartesian products of 2-polyhedra and present some positive results. In the world of continua such uniqueness results cannot be obtained.

Together with S.Kwasik we considered the Cartesian products of 3-manifolds and n-spheres. If n is even, then the product is unique, if n is odd it is not.