J. Oledzki; Stanisław Spież

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On embedding of curves into two-dimensional polyhedra

J. Olędzki and S. Spież

It is well known that curves (one-dimensional continua) can be embedded in the 3-dimensional Euclidean space. Some curves cannot be embedded into 2-dimensional polyhedra. For instance the Menger universal curve has such property, since each its point has no neighborhood which is flat (can be embedded in a plane). Some curver which are not flat can be embedded into 2-dimensional (even 1-dimensional) polyhedra. A disc is a set homeomorphic to a closed ball in the plane. An n-book is the union of n discs such that the intersection of this discs is a segment lying in their boundary and any two of them have no other common point. R.M. Bing has noticed that a solenoid (the invers limit of circles) which is not flat can be embedded in a 3-book; a solenoid can be obtained here as the intersection of a decreasing sequence of the Mobius surfaces with added disc, everything lying in a 3-book.

In shape theory it is known that for every curve X there exists a plane curve Y of the same shape as X if and only if X is movable. Our results are connected to the problem (due to J. Krasinkiewicz) what shapes are embeddable in an n-book, $n \geq 3$. It is proved that every one-dimensional compact metric space with zero-dimensional set of non-locally flat points can be embedded into a 3-book. In particular for every curve there exists curve in a 3-book of the same shape. It is noticed that if X is one-dimensional compactum and for every point $x \in X$ there exists a neighborhood U, which can be embedded in a 2-dimensional polyhedron then X can be embedded in a 2-dimensional polyhedron.