

The continuity of Darboux injections between manifolds

Taras Banakh

(Ivan Franko National University of Lviv, Lviv, Ukraine)

E-mail: `t.o.banakh@gmail.com`

We shall discuss a problem of Willie Wong who asked on Mathoverflow if every bijective Darboux map $f : X \rightarrow Y$ between Eculidean spaces (more generally, between manifolds) is a homeomorphism. A function between topological spaces is *Darboux* if the image of any connected subset is connected. We prove that an injective Darboux map $f : X \rightarrow Y$ between connected metrizable spaces X, Y is continuous if one of the following conditions is satisfied:

- (1) Y is a 1-manifold and X is compact;
- (2) Y is a 2-manifold and X is a closed 2-manifold;
- (3) Y is a 3-manifold and X is a rational homology 3-sphere.

More details can be found in the preprint <https://arxiv.org/abs/1809.00401>.