Chain connected sets in a topological space

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In the paper Shekutkovski [1] are compared two definitions of connectedness, the standard one and the definition using coverings. The second one seems to be very effective description of quasicomponents.

In our paper instead as a space, we generalized the notion to a set in a topological space called chain connected set.

Definition 1. A set C in a topological space X is chain connected if for every two elements $x, y \in \mathcal{U}$ and every open covering $\mathcal{U}$ of X in X, there exists a chain in $\mathcal{U}$ which connects x and y.

Also we introduced a notion of chain separated sets in a space and we study the properties of chain connected sets in a topological space. Moreover, we prove the properties of connected spaces using chain connectivity. Chain connectedness of two points in a topological space is an equivalence relation. Components of a chain connectedness of a set in a topological space are union of quasicomponents of the set, and if the set is equal with the space, components of a chain connectedness matches with a quasicomponents.

References

[1] N. Shekutkovski, On the concept of connectedness, Mat. Bilten **40**(1) (2016), 5–14.