

Squares of function spaces and function spaces on squares

*Mikołaj Krupski*¹

mkrupski@mimuw.edu.pl

For a Tychonoff space X , by $C_p(X)$ we denote the space of all continuous real-valued functions on X endowed with the topology of pointwise convergence. In the 1980s A.V. Arhangel'skii posed a problem whether for a (metrizable/compact) space X the space $C_p(X)$ is homeomorphic to its own square $C_p(X) \times C_p(X)$. Similar questions can be also formulated for linear homeomorphisms or linear continuous surjections from $C_p(X)$ onto $C_p(X) \times C_p(X)$ or onto $C_p(X \times X)$.

In my talk I will present some recent developments concerning these type of questions. In particular, I will show a metrizable counterexample to the problem of Arhangel'skii (the counterexample was obtained together with W. Marciszewski). It turns out that some counterexamples can naturally come from continuum theory, e.g. if M is a Cook continuum, then $C_p(M)$ cannot be mapped linearly onto $C_p(M) \times C_p(M)$.

I will also discuss some related problems and results (obtained in collaboration with A. Leiderman) concerning embeddings of free (abelian) topological groups of the form $A(X \times X)$ into $A(X)$, where X is a metric continuum.

Copyright © Krupski

¹ The author was partially supported by the Polish National Science Center research grant UMO-2012/07/N/ST1/03525

