55th International Symposium
on Functional Equations
Hongwa Hotel, Chengdu, China, June 11–18, 2017

On conservative and associative operations on finite chains

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(joint work with Miguel Couceiro and Jean-Luc Marichal)

We provide a full description of the class of conservative, associative, and symmetric operations $F\colon X^2 \to X$, where X is an arbitrary finite chain. Here, an operation $F\colon X^2 \to X$ is conservative if $F(x,y) \in \{x,y\}$ for all $x,y \in X$. We put a particular emphasis on the graphical properties of these operations by looking into their contour plots. We also investigate and describe the subclass of operations that are nondecreasing in each variable and we show how this description is related to the so-called single-peaked permutations.

References

1. M. Couceiro, J. Devillet, and J.-L. Marichal. Characterizations of idempotent discrete uninorms. *Fuzzy Sets and Systems*. Submitted for revision. arXiv:1701.07253