▸ DAVID M. EVANS, JAN HUBIČKA, MATĚJ KONEČNÝ, YIBEI LI, *Simplicity of automorphism groups of generalised metric spaces.*
Department of Mathematics, Imperial College London, London SW7 2AZ, UK.
*E-mail*: david.evans@imperial.ac.uk.
Department of Applied Mathematics (KAM), Charles University, Malostranské nám. 25, Prague, Czech Republic.
*E-mail*: hubicka@kam.mff.cuni.cz.
Department of Applied Mathematics (KAM), Charles University, Malostranské nám. 25, Prague, Czech Republic.
*E-mail*: matej@kam.mff.cuni.cz.
Imperial College London, London SW7 2AZ, UK.
*E-mail*: yibei.li16@imperial.ac.uk.

We study automorphism groups of homogeneous generalised metric spaces $\mathbb{F}$, where the distances come from a partially ordered commutative semigroup $\mathfrak{M} = (M; \oplus, \preceq)$ such that the ternary relation $\mathop{\downarrow}$ defined on finite subsets of $\mathbb{F}$ by

$$A \mathop{\downarrow}_C B \iff (\forall a \in A)\,(\forall b \in B)\,(d(a,b) = \inf_{\preceq}\{d(a,c) \oplus d(b,c) : c \in C\})$$

is a stationary independence relation as defined by Tent and Ziegler [1]. We adapt the proof of Tent and Ziegler that the automorphism group of the Urysohn ball is simple [2] and prove the same for $2 \leq |M| < \omega$ and *1-supported* $\mathop{\downarrow}$.

Such $\mathfrak{M}$-metric spaces were studied by Hubička, Konečný and Nešetřil [3, 4] in the context of Ramsey theory. They generalise most known binary symmetric homogeneous structures and in particular, as a corollary, we obtain simplicity of the automorphism groups of Cherlin's finite-diameter primitive 3-constrained metrically homogeneous graphs and a strengthening of the results of Li [5].

[1] Katrin Tent, Martin Ziegler, *On the isometry group of the Urysohn space*, ***Journal of the London Mathematical Society***, vol. 87 (2013), no. 1, pp. 289–303.

[2] ——— *The isometry group of the bounded Urysohn space is simple*, ***Bulletin of the London Mathematical Society***, vol. 45 (2013), no. 5, pp. 1026–1030.

[3] Matěj Konečný, *Semigroup-valued metric spaces*, Master thesis, Charles University, 2019. arXiv:1810.08963.

[4] Jan Hubička, Matěj Konečný, Jaroslav Nešetřil, *Semigroup-valued metric spaces: Ramsey expansions and EPPA*, In preparation.

[5] Yibei Li, *Simplicity of the automorphism groups of some binary homogeneous structures determined by triangle constraints*, arXiv:1806.01671.