Hisao Kato

On isometrical extension properties of function spaces

Comment.Math.Univ.Carolin. 56,1 (2015) 105 –115.

Abstract: In this note, we prove that any "bounded" isometries of separable metric spaces can be represented as restrictions of linear isometries of function spaces $C(Q)$ and $C(\Delta)$, where Q and Δ denote the Hilbert cube $[0,1]^\infty$ and a Cantor set, respectively.

Keywords: linear extension of isometry; theorem of Banach and Mazur; Hilbert cube; Cantor set

AMS Subject Classification: Primary 54C35, 46B04; Secondary 54H20

References

[1] Banach S., *Théories des Opérations Linéaires*, Hafner, New York, 1932, p. 185.

[2] Ikegami Y., Kato H., Ueda A., *Dynamical systems of finite-dimensional metric spaces and zero-dimensional covers*, Topology Appl. **160** (2013), 564–574.

[3] Mazur S., Ulam S., *Sur les transformation isométriques d'espace vectoriel normés*, C.R. Acad. Sci. Paris **194** (1932), 946–948.

[4] van Mill J., *Infinite-dimensional Topology: Prerequisites and Introduction*, North-Holland, Amsterdam, 1989.

[5] Sierpiński W., *Sur un espace métrique séparable universel*, Fund. Math. **33** (1945), 115–122.

[6] Stone M.H., *Applications of the theory of Boolean rings to general topology*, Trans. Amer. Math. Soc. **41** (1937), 375–381.

[7] Urysohn P., *Sur un espace métrique universel*, Bull. Sci. Math. **51** (1927), 43–64.

[8] Uspenskij V.V., *On the group of isometries of the Urysohn universal metric space*, Comment. Math. Univ. Carolin. **31** (1990), 181–182.

[9] Uspenskij V.V., *A universal topological group with a countable base*, Funct. Anal. Appl. **20** (1986), 86–87.