İSTANBUL ANALYSIS SEMINARS

CLASSIFICATION OF INJECTIVE BANACH LATTICES

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Abstract: The purpose of this talk is to give a complete isometric classification of injective Banach lattices. The class of injective Banach lattices was first introduced and studied by Lotz in 1975. Lotz proved, in particular, that any Dedekind complete AM-space with unit and an arbitrary AL-space are injective Banach lattices. It is shown that any injective Banach lattice can be constructed from these spaces by using the operations of direct sum and tensor product. On this basis, we are able to specify a complete system of invariants determining an injective Banach lattice up to lattice isometry and represent any injective Banach lattice as the direct sum of Banach lattices of continuous vector functions. So far, these problems have remained open in the framework of the existing structure theory of injective Banach lattices. The proofs are based on two key results, namely, on a description of AL-spaces, which follows from Maharam's theorem on representation of Boolean algebras, and on the Boolean valued transfer principle, according to which any injective Banach lattice becomes an AL-space under an immersion in a suitable Boolean valued model.

***Date*:**	April 18, 2014
***Time*:**	15:40
***Place*:**	Sabancı University, Karaköy Communication Center Bankalar Caddesi 2, Karaköy 34420, İstanbul

İstanbul Analysis Seminars is supported by TÜBİTAK.