

The Theory of Spectrum Exchangeability

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Abstract

Spectrum Exchangeability, Sx , is an irrelevance principle of Pure Inductive Logic, and arguably the most natural (but not the only) extension of Atom Exchangeability to polyadic languages. It has been shown¹ that all probability functions which satisfy Sx are comprised of a mixture of two essential types of probability functions; heterogeneous and homogeneous functions. We determine the theory of Spectrum Exchangeability, which for a fixed language L is the set of sentences of L which must be assigned probability 1 by every probability function satisfying Sx , by examining separately the theories of heterogeneity and homogeneity. We find that the theory of Sx is equal to the theory of finite structures, i.e. those sentences true in all finite structures for L , and it emerges that Sx is inconsistent with the principle of Super-Regularity (Universal Certainty). As a further consequence we are able to characterize those probability functions which satisfy Sx and the Finite Values Property.

Key words: Spectrum Exchangeability, Finite Values Property, Inductive Logic, Logical Probability, Rationality, Uncertain Reasoning.

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¹See [?], [?], [?], [?], [?]