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## Model Theory for Measure Structures

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Probability logics, studied by D. N. Hoover [1] and J. Keisler [2] are logics which handle probability quantifiers. In the semantic side, they are logics which study probability spaces endowed with an algebraic structure, e.g. probability spaces quipped with a set of random variables, locally compact groups with the Haar measure and dynamical systems. Such structures are generally called graded probability structures in [2]. One form of probability logics is the integral logic where logical symbols consist of: real numbers as possible values for formulas, continuous operations of  $\mathbb{R}$  as connectives and integration as a quantifier. In this paper, we develop the model theory of graded measure structures of finite measure based on the integral logic. We give an ultraproduct construction and prove a Los type theorem. Then we deduce the compactness theorem. We also prove some elementary results on graded structures.

## References

- [1] D.N. Hoover, Probability logic, *Annals of Mathematical Logic* 14 (1978) 287-313.
- [2] H.J. Keisler, Probability quantifiers, in *Model Theoretic Logic*, edited by J. Barwise and S. Feferman, Springer-Verlag 1985.