Spectral-like and Priestley-style Duality for Distributive Hilbert Algebras with Infimum

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Recently, they have been studied [5, 6, 4, 1] Spectral-like and Priestley-style dualities for Distributive meet semilattices and Hilbert Algebras (the algebraic counterpart of the implicative fragment of intuitionistic logic). By *Spectral-like* we mean dualities based on compactly based sober spaces. By *Priestley-style* we mean dualities based on Priestley spaces.

Distributive Hilbert Algebras with infimum, or $DH^{\wedge}$-algebras, are included in the variety that is the algebraic counterpart of the implicative fragment of intuitionistic logic, augmented with a conjunction that is not necessarily the residuum of the implication, as it is in the intuitionistic case.

In this talk on our two forthcoming papers [7, 8], we introduce two special kinds of spaces, based on compactly based sober spaces and Priestley spaces respectively, that were inspired by the dualities previously mentioned. We prove that the categories of these spaces, together with certain kinds of relations, are dually equivalent to the category of $DH^{\wedge}$-algebras and semi-homomorphisms. We restrict this result to give two dualities for the category of $DH^{\wedge}$-algebras and homomorphisms. This dualities generalizes the ones presented in [3, 2] for implicative semilattices. We show how each one of these categories can be construct from the other. Moreover, we use the Spectral-like duality to give a dual characterization of the main classes of filters for these algebras, namely (irreducible) meet filters, (irreducible) implicative filters and absorbent filters.

References

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