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Graphs, polarities and completions of lattices

In [3] and [2] a one-to-one correspondence between the category of perfect lattices and the category of particular polarities, the so-called RS frames, is established. Since the canonical extensions of bounded lattices are perfect lattices, we may associate to any bounded lattice **L** the RS frame of its canonical extension, which sets are formed respectively by the completely join-irreducible and the completely meet-irreducible elements of the canonical extension. Such an RS frame can be obtained from a graph determined by **L**. This graph has particular properties which we use to define the category of TiRS graphs. The properties of these graphs can be translated into properties of polarities, giving rise to TiRS frames, which are RS frames satisfying an additional property. We prove that the category of TiRS graphs and the category of TiRS frames are equivalent. The RS frames associated to canonical extensions are TiRS frames and consequently can be obtained from TiRS graphs.

References:

[1] A.P.K. Craig, M. J. Gouveia and M. Haviar, TiRS graphs and TiRS frames: a new setting for duals of canonical extensions (submitted).

[2] J.M. Dunn, M. Gehrke, A. Palmigiano, Canonical extensions and relational completeness of some substructural logics, *J. Symbolic Logic* 70 (2005), 713–740.

[3] M. Gehrke, Generalized Kripke frames *Studia Logica* 84 (2006), 241–275.

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