COMPACTIFICATION OF $\kappa$-FRAMES

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ABSTRACT. In this paper we show that the category $\text{KR}_\kappa \text{Frm}$, of all compact regular $\kappa$-frames and $\kappa$-frame homomorphisms, is a coreflective subcategory of the category $\kappa \text{Frm}$, of all $\kappa$-frames and $\kappa$-frame homomorphisms. Then, a compactification for any completely regular $\kappa$-frame and any proximal $\kappa$-frame is given. The theory of $\kappa$-frames was introduced by Madden [3].

1. Background

Here we recall some notions and notations from [2], [4].

1.1 Let $\kappa$ be any regular cardinal. A $\kappa$-set is a set of cardinality strictly less than $\kappa$. A $\kappa$-frame is a bounded lattice $L$ which has joins of $\kappa$-subsets and satisfies the distributive law:

$$x \land \bigvee S = \bigvee \{x \land s : s \in S\}$$

for $x \in L$ and $S$ a $\kappa$-subset of $L$. A $\kappa$-frame homomorphism $h : L \rightarrow M$ is a lattice homomorphism preserving joins of $\kappa$-subsets. The resulting category is denoted by $\kappa \text{Frm}$. The theory of $\kappa$-frames was introduced by Madden [3].