

Roundup: Ultraproducts

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Łos's Theorem guarantees that the diagonal embedding $\Delta: \mathbf{A} \rightarrow \prod_{\mathcal{U}} \mathbf{A}$ of \mathbf{A} into an ultrapower is an elementary embedding. We can use this to produce large elementary extensions of \mathbf{A} if we can make ultrapowers large.

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Thus, ultrapowers may be used to construct arbitrarily large elementary extensions of infinite structures.

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Shelah, Saharon

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Israel J. Math. 10 (1971), 224-233.

Characterizing the closure of a class of L -structures

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- 4 (Keisler-Shelah) $\mathcal{J} = \sqrt[u]{\text{P}_u(\mathcal{K})}$. ($\sqrt[u]{}$ = closure under ‘ultraroots’.)