

Generators, product completions and total cocompleteness

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The existence of a (strong or regular) generator in a category \mathcal{A} is equivalent to the existence of a generator of the same type in the free product completion $\Pi\mathcal{A}$ of \mathcal{A} . This, combined with the fact that a category \mathcal{A} is multitotal (that is, the Yoneda embedding of \mathcal{A} is right multiadjoint) iff $\Pi\mathcal{A}$ is total, gives a number of important consequences on multitotal categories with generators. However, the case of dense generators differs from the other type of generators. We show that the existence of a dense generator in $\Pi\mathcal{A}$ for every category \mathcal{A} with a multi-initial object is equivalent to the non existence of arbitrarily large measurable cardinals.

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