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Cotorsion theories and Σ-pure injective cotilting modules

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Let R be a ring. Given a cotorsion pair $\mathfrak{A} := (\mathcal{A}, \mathcal{A}^{\perp})$ in the category of right R-modules Mod-R, we denote by $\mathfrak{A}_\ell$ the cotorsion pair generated by the modules M in $\mathcal{A}$ which admit a resolution

$$P_\ell \to ... \to P_1 \to P_0 \to M \to 0$$

with P_i, $0 \leq i \leq \ell$ finitely generated projective modules. We compare the cotorsion theories $\mathfrak{A}_\ell$, looking for conditions which guarantee the equalities $\mathfrak{A}_\ell = \mathfrak{A}_{\ell+n}$, $n \in \mathbb{N}$, and / or $\mathfrak{A}_\ell = \mathfrak{A}$. Particular emphasis is dedicated to cotorsion theories cogenerated by a cotilting module in the Noetherian case.