

1084-16-195

Xianhui Fu (fuxianhui@gmail.com), Department of Mathematics and Statistics, Northeast Normal University, Changchun, Peoples Rep of China, **Pedro A. Guil Asensio*** (paguil@um.es), Department of Mathematics, University of Murcia, Murcia, Spain, **Ivo Herzog** (iherzog@lima.ohio-state.edu), The Ohio State University at Lima, Lima, OH , and **Blas Torrecillas** (btorreci@ual.es), Department of Algebra and Functional Analysis, University of Almeria, Almeria, Spain. *Ideal approximation theory.*

Let $(\mathcal{A}; \mathcal{E})$ be an exact category and F , a subfunctor of Ext . We define the notions of phantom morphism relative to F , and of special precovering ideal of $(\mathcal{A}; \mathcal{E})$. We show that, when the exact category $(\mathcal{A}; \mathcal{E})$ has enough injective objects and projective morphisms, then an ideal I of \mathcal{A} is special precovering if and only if there is a subfunctor F of Ext with enough injective morphisms such that I is the ideal of F -phantom morphisms. We apply this result to show that several well-known ideal cotorsion pairs are complete. Namely, the ideal cotorsion pair cogenerated by the pure-injective modules of $R\text{-Mod}$; the ideal cotorsion pair cogenerated by the contractible complexes in the category of complexes $Ch(R\text{-Mod})$; and the ideal cotorsion pair cogenerated by the Jacobson radical $Jac(A\text{-mod})$ of the category $A\text{-mod}$ of finitely generated representations of an Artin algebra A . (Received September 01, 2012)