

**MARK KLEINER**  
Syracuse University

*Hereditary abelian categories with a Serre duality and comodules over path coalgebras (50-60)*

*Contributed talk authors: Mark Kleiner and Idun Reiten, Syracuse University and Norwegian University of Science and Technology*

This work is the result of trying to understand the connections between the papers “Noetherian hereditary abelian categories satisfying Serre duality,” by Reiten and Van den Bergh, and “Almost split sequences for comodules,” by Chin, Kleiner, and Quinn. The existence of connections became clear when the first-named author attended the talks given by the second-named author at ICRA IX in Beijing. Let  $k$  be an algebraically closed field and let  $\mathcal{A}$  be an Ext-finite hereditary abelian Krull-Schmidt  $k$ -category with enough injectives and each simple object having a projective cover of finite length. The following are equivalent: (a)  $\mathcal{A}$  has left almost split sequences; (b)  $\mathcal{A}$  has a left Serre functor; (c)  $\mathcal{A}$  is equivalent to the category of finitely minimally copresented comodules over the path coalgebra of a locally finite quiver with at most finitely many paths starting at each vertex. Applying the duality  $\text{Hom}_k(-, k)$ , we obtain information about the relevant categories having a right Serre functor and Serre duality.