The Generalized Auslander-Reiten Conjecture and Derived Equivalences

This is joint work with Kosmas Diveris. In a paper from 1975, Maurice Auslander and Idun Reiten stated the following conjecture: "If $M$ is an $R$-module with $\text{Ext}^i(M, M \oplus R) = 0$ for all $i > 0$, then $M$ is a projective module." This conjecture remains open for "most" classes of rings, including for artin algebras and commutative rings. A natural generalization is the following statement: "If $M$ is an $R$-module with $\text{Ext}^i(M, M \oplus R) = 0$ for all $i > 0$, then $M$ has finite projective dimension."

In our talk we discuss these conjectures, give a version of the latter conjecture for any triangulated category, and use it to show that the generalized version of the Auslander-Reiten Conjecture is stable under any derived equivalence of noetherian rings.