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In joint work with Tokuji Araya (Illinois Journal of Mathematics Vol. 64, No. 2, 2020), we defined the reducing Gorenstein dimension, an extension of the classical Gorenstein dimension, for finitely generated modules over commutative Noetherian local rings. We studied the basic properties of this new invariant and constructed examples of modules that have infinite, but finite reducing, Gorenstein dimension.

A result of Henrik Holm (Proceedings of the American Mathematical Society, Vol. 132, No. 5, 2004) implies that, a local ring R is Gorenstein if there exists a nonzero finitely generated R -module that has finite injective and finite Gorenstein dimension. In an ongoing joint work with Tokuji Araya, Jesse Cook and Toshinori Kobayashi, we considered the question whether the conclusion of Holm's result also holds for modules that have finite injective and finite reducing Gorenstein dimension. In this talk I will report on the affirmative answers we obtained concerning this query. (Received January 16, 2021)