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Syzygy Computations in OI-Modules

Given a sequence of related modules M_n defined over a sequence of related polynomial rings, one may ask how to simultaneously compute the syzygy module of each M_n. Working in the setting of OI-modules over Noetherian polynomial OI-algebras, we present an OI-analogue of Schreyer's theorem for computing syzygies. Here, OI denotes the category of totally ordered finite sets with order-preserving injective maps.