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Generalizations of Ulrich Modules and Rigidity Theorems. Preliminary report.

Let (R, \mathfrak{m}, k) be a Noetherian local ring. A finitely generated R -module M is said to be Ulrich if it is maximal Cohen-Macaulay and its minimal number of generators is equal to its Hilbert-Samuel multiplicity. We consider several weakenings of the Ulrich condition; we prove existence of these modules in some cases and study their properties. In particular, we prove some rigidity theorems which extend work of Ulrich, Hanes-Huneke, and Jorgensen-Leuschke. (Received July 15, 2019)