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Projective resolutions of Cohen-Macaulay algebras.

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The goal of this paper is to write down a “universal” resolution for certain factor rings which is minimal in some cases of interest. Let A be a ring of the form $k[x_1, \dots, x_n]/I$; k is a field. By the Noether normalization theorem, A will be, after a change of variables, a finitely generated module over $R = k[x_1, \dots, x_d]$, $d = \dim A$. The ring A is a Cohen-Macaulay ring if and only if A is free over R . In this case $A = R \oplus E$, as R -modules, for a certain R -module E . The main result, Theorem 3.2, provides a resolution of A . The main technical tool in constructing this resolution is the “universal” resolution of G. Scheja and U. Storch [Manuscripta Math. **19** (1976), no. 1, 75–104; [MR0407039](#); errata, *ibid.* **20** (1977), no. 1, 99–100; [MR0429932](#)]. Other cases of interest are 2-dimensional rational singularities and the (“relatively Cohen-Macaulay”) total space of the versal deformation of a ring of the form $k[x_1, \dots, x_r]/(x_1, \dots, x_r)^2$. *P. Schenzel*

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