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The Eisenbud-Green-Harris conjecture for fast-growing degree sequences

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Abstract. Let S be a standard graded polynomial ring over a field, and I be a homogeneous ideal that contains a regular sequence of degrees $d_1, \dots, d_n$. We prove the Eisenbud-Green-Harris conjecture when the forms of the regular sequence satisfy $d_i \geqslant \sum_{j=1}^{i-1}(d_j - 1)$, improving a result obtained in 2008 by the first author and Maclagan. Except for the sporadic case of a regular sequence of five quadrics, due to Güntürkün and Hochster and for which we include a short alternative argument, the results of this paper recover all known cases where only the degrees of the regular sequence are fixed.

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