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Betti numbers for the Hilbert function strata of the punctual Hilbert scheme in two variables. (English) [Zbl 0714.14004](#)

Manuscr. Math. 66, No. 3, 253-259 (1990).

Let k be an algebraically closed field, $R = k[[x, y]]$, $m = (x, y)$ the maximal ideal of R and $h(I)(z) = \sum h_i(I)z^i$ the Hilbert function of an ideal I of R of *colength* n where $h_i(I) = \dim_k(m^i / ((I \cap m^i) + m^{i+1}))$. For a fixed polynomial h with nonnegative integer coefficients and $h(1) = n$ the ideals I with Hilbert function $h(I) = h$ are parametrized by a locally closed subscheme Z_h of the punctual Hilbert scheme $Hilb^n R$ and give a stratification $Hilb^n R = \cup_{h(1)=n} Z_h$ [A. A. Iarrobino, Mem. Am. Math. Soc. 188 (1977; [Zbl 0355.14001](#)), Bull. Am. Math. Soc. 78, 819-823 (1972; [Zbl 0268.14002](#)) and J. Briançon, Invent. Math. 41, 45-89 (1977; [Zbl 0353.14004](#))].

The author constructs a cellular decomposition of the strata Z_h and computes their Betti numbers by modifying the cellular decomposition of $Hilb^n \mathbb{P}_2$ given by G. Ellingsrud and S. A. Strømme [Invent. Math. 87, 343-352 (1987; [Zbl 0625.14002](#))].

Reviewer: [A.Papantonopoulou](#)

MSC:

[14C05](#) Parametrization (Chow and Hilbert schemes)
[13D40](#) Hilbert-Samuel and Hilbert-Kunz functions; Poincaré series

Cited in **3** Reviews
Cited in **7** Documents

Keywords:

[Hilbert stratum](#); [Hilbert function](#)

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