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*Cohomology ring of punctual Hilbert Schemes*

Let  $S$  be a smooth surface and  $\text{Hilb}^d(S)$  the associated punctual Hilbert scheme. The Betti numbers of  $\text{Hilb}^d(S)$  are described by a formula of Gottsche. The question of the cohomology ring of the Hilbert schemes has been studied by several authors but is still open in general.

We will explain how to compute the cohomology ring when  $S$  is a toric surface.