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I. Gordon, Department of Mathematics, Glasgow University, Glasgow, G12 8QW, Scotland, and
J. T. Stafford* (jts@umich.edu), Department of Mathematics, University of Michigan, Ann Arbor, MI 48109. *Rational Cherednik algebras and Hilbert schemes of points.*

Let H_c be the rational Cherednik algebra of type A_{n-1} with spherical subalgebra $U_c = eH_c e$. Then U_c is filtered by order of differential operators, with associated graded ring $\text{gr } U_c = \mathbb{C}[\mathfrak{h} \oplus \mathfrak{h}^*]^W$ where W is the n -th symmetric group. We construct a filtered \mathbb{Z} -algebra B such that, under mild conditions on c , the category B -qgr of graded noetherian B -modules modulo torsion is equivalent to U_c -mod. Moreover, the associated graded \mathbb{Z} -algebra $\text{gr } B$ satisfies $\text{gr } B\text{-qgr} \simeq \text{coh Hilb}(n)$, the category of coherent sheaves on the Hilbert scheme of n points in the plane.

In many ways the properties of U_c (and therefore of the Morita equivalent ring H_c) are similar to those of a primitive factor ring of the enveloping algebra of a semisimple Lie algebra. Under this analogy this result is reminiscent of the Beilinson-Bernstein equivalence of categories. As we will explain, it is also a powerful tool for studying the representation theory of H_c and for elucidating its relationship to $\text{Hilb}(n)$. (Received February 18, 2005)