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*Deformations of Differential Operators.*

A classical paper of Hayashi presents a quantum Weyl algebra which both deforms the classical Weyl algebra and produces representations of  $U_q(\mathfrak{g})$  analogous to the representation of  $U(\mathfrak{g})$  through the Weyl algebras. More recently, Lunts and Rosenberg defined differential operators for noncommutative rings, and subsequently some quantum deformations of these algebras. We show that in fact Hayashi's algebras are subalgebras of differential operators on appropriately chosen rings. Further, we show induced representations of the quantum group are preserved through this embedding. Additionally, we show the relationship between this result and the quantum analog of the theorem of Beilinson-Berstein, and how to extend these results to more general deformations of graded rings. Finally, we show how to "untwist" the deformations of the differential operators into deformations of underlying rings, and vice-versa. (Received August 25, 2012)