1128-16-245 **Ellen E. Kirkman*** (kirkman@wfu.edu), Dept of Mathematics and Statistics, Wake Forest University, Winston Salem, NC 27109, and **Jianmin Chen** and **James J. Zhang**. *Invariant subrings of noetherian graded down-up algebras under group coactions.*

Let $\mathbb{k}$ be a field of characteristic zero, $\mathbb{D} = \mathbb{D}(\alpha, \beta)$ be a noetherian down-up algebra that is graded by a finite group G, and $H = \mathrm{Hom}_{\mathbb{k}}(\mathbb{k}G, \mathbb{k})$ be the $\mathbb{k}$-linear dual of the group algebra $\mathbb{k}G$. The fixed subring $\mathbb{D}^H$ under the Hopf algebra H can be identified with the identity component $\mathbb{D}_e$ under the G-grading. We prove that $\mathbb{D}$ is rigid in the sense that $\mathbb{D}^H$ is never AS regular (so $\mathbb{D}^H$ is not isomorphic to $\mathbb{D}$), and hence each $\mathbb{D}$ has no dual reflection group. Further, we prove that when the homological determinant of the H-action on $\mathbb{D}$ is trivial and H acts homogeneously on $\mathbb{D}$, Auslander's Theorem holds: the smash product $\mathbb{D}\#H$ is naturally isomorphic to $\mathrm{End}_{\mathbb{D}^H}(\mathbb{D})$, as $\mathbb{k}$-algebras. (Received February 27, 2017)