1125-16-2130 **Ellen E. Kirkman*** (kirkman@wfu.edu), **Jianmin Chen** (chenjianmin@xmu.edu.cn) and **James J. Zhang** (zhang@math.washington.edu). *Invariant subrings of noetherian graded down-up algebras under group coactions.*

Let $\Bbbk$ 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 $H = \mathrm{Hom}_{\Bbbk}(\Bbbk G, \Bbbk)$ be the $\Bbbk$-linear dual of the group algebra $\Bbbk G$. 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. We provide further results for coactions on the down-up algebra $\mathbb{D} := \mathbb{D}(\alpha = 0, \beta = 1)$. As one example, when the homological determinant of the H-action on $\mathbb{D}$ is trivial, we have Auslander's Theorem: the smash product $\mathbb{D}\#H$ is isomorphic to $\mathrm{End}_{\mathbb{D}^H}(\mathbb{D})$, as $\Bbbk$-algebras. (Received September 19, 2016)