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 \( k \) be a field of characteristic zero, \( D = D(\alpha, \beta) \) be a noetherian down-up algebra that is graded by a finite group \( G \), and \( H = \text{Hom}_k(kG, k) \) be the \( k \)-linear dual of the group algebra \( kG \). The fixed subring \( D^H \) under the Hopf algebra \( H \) can be identified with the identity component \( D_e \) under the \( G \)-grading. We prove that \( D \) is rigid in the sense that \( D^H \) is never AS regular (so \( D^H \) is not isomorphic to \( D \)), and hence each \( D \) has no dual reflection group. We provide further results for coactions on the down-up algebra \( D := D(\alpha = 0, \beta = 1) \). As one example, when the homological determinant of the \( H \)-action on \( D \) is trivial, we have Auslander’s Theorem: the smash product \( D \# H \) is isomorphic to \( \text{End}_{D^H}(D) \), as \( k \)-algebras. (Received September 19, 2016)