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Kevin Dilks and **Oliver Pechenik***, Department of Mathematics, Rutgers University, 110 Frelinghuysen Rd., Piscataway, NJ 08854, and **Jessica Striker**. *Taking the long way home: Orbits of plane partitions.*

Plane partitions are piles of cubes stacked in the corner of a room. P. Cameron and D. Fon-der-Flaass (1995) studied a simple action on such piles, whose dynamics are nonetheless quite mysterious. In particular, repeating this action will always eventually return the original pile, but sometimes the voyage is much longer than expected. To understand the Grothendieck rings of algebraic vector bundles over Grassmannians and other spaces, H. Thomas and A. Yong (2009) introduced a suite of combinatorial algorithms on certain grids of numbers. In particular, there is an attractive K -theoretic promotion operator, which again has some mysteriously large orbits. We'll see how these two mysteries are in fact the same mystery, and use this relation to explain special cases of both actions. (Received July 14, 2016)