1108-05-249   **Tri Lai** (`tmlai@indiana.edu`), Institute for Mathematics and its Application, Minneapolis, MN 55455, and **Gregg Musiker*** (`musiker@math.umn.edu`), School of Mathematics, University of Minnesota, Minneapolis, MN 55455. *Combinatorics of the dP3 Quiver: Aztec Castles and Beyond.* Preliminary report.

We consider a specific six-vertex quiver, the dP3 quiver, and toric mutation sequences of it, i.e. mutations which only occur at a vertex with two in-coming arrows and two out-going arrows. Previous work of the second author with REU students I. Jeong and S. Zhang, and later with REU students M. Leoni, S. Neel, and P. Turner, led to combinatorial interpretations for cluster variables arising from a two-dimensional subspace of toric mutations. In the present work, we extend this combinatorial interpretation to a three-dimensional subspace, and study the integrability of these mutation sequences. (Received January 15, 2015)