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Anton Dzhamay* (adzham@unco.edu), School of Mathematical Sciences, University of Northern Colorado, 501 20th Street, Greeley, CO 80639. *Combinatorics of matrix refactorizations and discrete integrable systems.*

Many interesting questions in the theory of discrete integrable systems, such as Lax representations, Yang-Baxter maps, and dynamics of discrete Painlevé equations, can be formulated in terms of refactorization transformations of rational matrix functions. One way to better understand such transformations is to study the non-trivial relations that the eigenvectors of these matrix functions must satisfy. We give a geometric representation of some of these relations and consider their applications. In particular, we show how to encode, in a very natural way, the generating functions of refactorization transformations (i.e., the Lagrangians of the corresponding discrete integrable systems) in some simple cases. (Received September 22, 2011)