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Anton Dzhamay* (adzham@unco.edu), 2250A Ross Hall, School of Mathematical Sciences,
University of Northern Colorado, Greeley, CO 80639. *On the Lagrangian Description of Discrete
Integrable Systems*. Preliminary report.

We consider Lax representations of discrete integrable systems whose space of Lax matrices is the space of $m \times m$ rational matrix functions. The discrete dynamics is given by the transformations of the form $\tilde{L}(z) = R(z)L(z)R(z)^{-1}$, where $R = R(L)$. This dynamic is symplectic with respect to a natural symplectic form, called the Krichever-Phong form. A nice feature of this form is that it can be written, in a very general setting, completely in terms of the Lax representation data. In this project, joint with I. Krichever, we study the Lagrangian description of such systems. (Received September 22, 2009)