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**Dylan J Murphy\*** ([djmurphy@email.arizona.edu](mailto:djmurphy@email.arizona.edu)). *Additions and the Toda Hierarchy*.

In a series of papers starting in 1986, McKean considered a special class of Darboux transformations of Schrödinger operators called “additions.” These transformations have the property of preserving the spectrum of the original operator, and turn out to have a close connection to the Korteweg-de Vries (KdV) hierarchy of integrable PDEs, including the fact that an “infinitesimal” addition generates the flows of all equations in the hierarchy.

We develop an analogous class of transformations on the space of Jacobi operators, extending the commutation methods developed by Gesztesy, Holden, Simon, and Zhao, and explore their connection to the Toda hierarchy of difference/differential equations (which may be regarded as a spatially discrete version of the KdV hierarchy). (Received September 17, 2019)