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**Tom Needham** and **Clayton Shonkwiler\*** (clay@shonkwiler.org). *Hamiltonian Group Actions on Frame Spaces.*

A frame for a finite-dimensional complex vector space is simply a spanning set. Frames include bases, but also spanning sets that are larger than a basis, and hence more suitable for applications where robustness to noise and erasures are important.

Since complex vector spaces are naturally symplectic, the space of frames is a symplectic manifold. Moreover, it admits natural Hamiltonian actions of a number of compact Lie groups, and several submanifolds of frames of particular interest, including Parseval frames and unit-norm frames, arise naturally as level sets of the momentum maps associated with these group actions.

Level sets of momentum maps of Hamiltonian group actions are important objects in symplectic geometry, and many powerful tools can be used to study them. After introducing this perspective, I will describe how it gives new insight into some important problems in frame theory, including the frame homotopy conjecture and the Paulsen problem. (Received September 13, 2019)