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The pseudo-unitary group $SU(1,1)$ admits a natural, multiplicative Poisson structure. This structure is analogous to the canonical Poisson structure on the unitary group $SU(2)$. The Lie algebra of $SU(1,1)$ also admits a natural, linear Lie-Poisson structure, as in the unitary case. These Poisson structures are related to important questions in Hamiltonian and quantum mechanics, dynamical systems, WZW models, etc.

We study two questions concerning the multiplicative and Lie-Poisson structures associated to $SU(1,1)$. First, a theorem of Ginzburg and Weinstein posits the existence of a Poisson isomorphism between the multiplicative and linear Poisson structures for the unitary case. We prove, in two different ways, an analogue of this theorem for the pseudo-unitary case. Second, we establish an analogue of the Thompson Conjecture, which relates singular values in the multiplicative setting to eigenvalues in the linear setting, for the group $SU(1,1)$ - a surprising result in the non-compact setting, which is likely to have further generalizations. (Received September 22, 2011)