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*A Hamiltonian circle action on the triple reduced product of coadjoint orbits of  $SU(3)$*

The fundamental group of the three-punctured sphere is the free group on two generators – or, more symmetrically, the group on three generators with one relation (so that the product of the generators equals the identity). Representations of this group in compact Lie groups have been much studied (as a building block in the theory of flat connections on 2-manifolds). This is related to the Verlinde algebra.

Analogously one may study the symplectic quotient at 0 of the product of three coadjoint orbits of a Lie group (the triple reduced product). (This is the same as the space of representations of the fundamental group of the three-punctured sphere when the three orbits are very close to zero, close enough that the exponential map gives a bijection.) For regular orbits of  $G = SU(3)$  we have constructed this symplectic quotient explicitly and confirmed that it is a 2-sphere, as one would expect on general grounds. We describe how to explicitly find a function whose Hamiltonian flow gives an  $S^1$  action on this 2-sphere.

(Joint work in progress with Steven Rayan, Gouri Seal, Paul Selick and Jonathan Weitsman)