1046-57-752 **William M Goldman**, **Greg McShane**, **George Stantchev** and **Ser P Tan*** (mattansp@nus.edu.sg), Department of Mathematics, National University of Singapore, 2, Science Drive 2, Singapore, 117543, Singapore. *Dynamics of the modular group action on certain character varieties of the two generator free group.*

The automorphisms of a two-generator free group π acting on the space of orientation-preserving isometric actions of π on hyperbolic 3-space defines a dynamical system. Those actions which preserve a hyperbolic plane but not an orientation on that plane is an invariant subsystem, which reduces to an action of a group Γ on $\mathbb{R}^3$ by polynomial automorphisms preserving the cubic polynomial $k(x,y,z) := -x^2-y^2+z^2+xyz-2$. The Fricke space of marked hyperbolic structures on the 2-holed projective plane with geodesic boundary or cusps identifies with the subset $\Omega(C_{0,2}) \subset \mathbb{R}^3$ defined by $z \leq -2$ and $xy+z \geq 2$. The generalized Fricke space of marked hyperbolic structures on the 1-holed Klein bottle with a geodesic boundary, cusp, or cone point identifies with the subset $\Omega(C_{1,1}) \subset \mathbb{R}^3$ defined by $z > 2$ and $xyz \geq x^2+y^2$. We show that Γ acts properly on the subsets $\Gamma \cdot \Omega(C_{0,2})$ and $\Gamma \cdot \Omega(C_{1,1})$. Furthermore for each $k_0 \in \mathbb{R}$, the action of Γ is ergodic on the complement of $\Gamma \cdot \Omega(C_{0,2})$ in $k^{-1}(k_0)$ for $k_0 < 2$. The complement of $\Gamma \cdot \Omega(C_{1,1})$ in $k^{-1}(k_0)$ for $k_0 > 2$ has empty interior. (Received September 10, 2008)