Combinatorial methods on actions on character varieties

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In this talk we consider the $\text{SL}(2, \mathbb{C})$–character variety $X := \text{Hom}(\pi_1(S), \text{SL}(2, \mathbb{C}))//\text{SL}(2, \mathbb{C})$ of the four-holed sphere $S$, and the natural action of the mapping class group $\text{MCG}(S)$ on it. In particular, we describe a domain of discontinuity for the action of $\text{MCG}(S)$ on the relative character varieties $X_{(a,b,c,d)}$, which is the set of representations $\rho: \pi_1(S) \to \text{SL}(2, \mathbb{C})$ for which the traces of the boundary curves are fixed. Time permitting, in the case of real characters, we show that this domain of discontinuity may be non-empty on the components where the relative Euler class is non-maximal. (This is a joint work with F. Palesi and S. P. Tan.)

I will recall the basic definitions and focus on the combinatorial methods of the proofs.