1035-14-1203   **Elisha Peterson*** (`elisha.peterson@usma.edu`), Department of Mathematical Sciences, United States Military Academy, West Point, NY 10996. *The Character Variety's New Clothes: how trace diagrams reveal new structure and simplify computations in the coordinate ring.*

Trace diagrams are a special class of marked graphs which form a planar algebra. The language of trace diagrams gives rise to a simple expression of the coordinate ring of character varieties. We describe the connection between trace diagrams and the coordinate ring, and depict a particular basis of the coordinate ring using trace diagrams. In the case of $SL(2, C)$ character varieties, we show how trace diagrams may be used both to algorithmically compute the basis functions and to multiply basis functions together. (Received September 19, 2007)