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Matthew Hedden, Christopher M. Herald* (herald@unr.edu) and **Paul Kirk**. *Traceless representations, tangles and a Lagrangian-Floer theory in the pillowcase*. Preliminary report.

We discuss a relatively $\mathbb{Z}/4$ graded Lagrangian-Floer chain complex for a particular class of 1-manifolds in the pillowcase, that is, the traceless character variety of the four-punctured 2-sphere. Given an appropriate 2-tangle decomposition of a knot, the traceless $SU(2)$ character varieties of the tangles give rise to Lagrangian submanifolds in the pillowcase. A Lagrangian-Floer chain complex is then generated by intersections, which correspond to the generators of Kronheimer-Mrowka singular instanton chain complex for the knot. We discuss the Atiyah-Floer conjecture relating these two Floer homology theories. (Received January 16, 2015)