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Daniel A. Ramras* (ramras@math.stanford.edu), Stanford University, Mathematics, Bldg. 380, 450 Serra Mall, Stanford, CA 94305. *Deformation K -theory of surface groups via Yang-Mills theory.*

Deformation K -theory, first introduced by Carlsson, provides a homotopy-theoretical setting for the study of representation spaces of infinite discrete groups. Using Morse theory for the Yang-Mills functional, we prove a theorem relating the deformation K -theory of $\pi_1(M^g)$ (where M^g denotes a compact Riemann surface of genus g) to the complex topological K -theory $K^*(M^g)$ of M^g itself. In fact, we show that the homotopy groups $K_{\text{def}}^*(\pi_1(M^g))$ agree with $K^*(M^g)$ for $* > 0$. This result may be viewed as an analogue of the Atiyah-Segal theorem, which relates representations of compact Lie groups to the topological K -theory of their classifying spaces.

Extensions to non-orientable surfaces will also be discussed. (Received September 27, 2006)