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Spinors, Lagrangians and rank 2 Higgs bundles. (English) Zbl 1408.14111

Summary: This article considers the Dirac operator on a Riemann surface coupled to a symplectic holomorphic vector bundle $W$. Each spinor in the null-space (which is a holomorphic section of $W \otimes K^{1/2}$) generates through the moment map a Higgs field $\Phi$, and varying $W$ one obtains a holomorphic Lagrangian subvariety in the moduli space of Higgs bundles. Applying this to the irreducible symplectic representations of $\text{SL}(2, \mathbb{C})$ we obtain Lagrangian submanifolds of the rank 2 Higgs bundle moduli space which link up with $m$-period points on the Prym variety of the spectral curve as well as Brill-Noether loci on the moduli space of semistable bundles. The case of genus 2 is investigated in some detail.

MSC:

14H60 Vector bundles on curves and their moduli
14H51 Special divisors on curves (gonality, Brill-Noether theory)
53C27 Spin and Spin$^c$ geometry
53D30 Symplectic structures of moduli spaces

Full Text: DOI