

Universal spectral covers and the Hitchin system

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We study spectral data for pairs (E, φ) , where $E \rightarrow X$ is a holomorphic vector bundle over a compact Riemann surface X and $\varphi : E \rightarrow E \otimes V$ is an endomorphism twisted by another holomorphic vector bundle $V \rightarrow X$, satisfying an *integrability condition* $\varphi \wedge \varphi = 0$. When $V = K_X$ is the canonical bundle of X , these pairs (E, φ) are *Higgs bundles*, which play a fundamental role in nonabelian Hodge theory. The study of spectral data for this last situation was made by Hitchin in 1987 and by Beauville, Narasimhan and Ramanan two years later for the more general case where $V = L$ is a line bundle.

Very recently, Chen and Ngô have explored spectral data for Higgs bundles over higher dimensional algebraic varieties X , defined by Simpson as pairs (E, φ) , with $E \rightarrow X$ an algebraic vector bundle over X and $\varphi : E \rightarrow E \otimes \Omega_X^1$ an endomorphism twisted by the algebraic cotangent bundle Ω_X^1 of X , satisfying again an *integrability condition* $\varphi \wedge \varphi = 0$. Clearly, this situation shares a lot of similarities with our problem.

In this talk we review the *universal spectral cover*, the *Higgs stack*, the *universal Hitchin map*, and the *spectral correspondence* given by Chen and Ngô. We conclude by constructing *flat spectral curves* for our situation, whose existence guarantees that the generic fibres of the Hitchin morphism are not empty.
