1115-53-34 **Adam Jacob*** (ajacob@math.ucdavis.edu), **Tristan C Collins** and **Shing-Tung Yau**. *(1,1) forms with specified Lagrangian phase.*

Let (X, α) be a Kähler manifold of dimension n, and let $[\omega] \in H^{1,1}(X, \mathbb{R})$. We study the problem of specifying the Lagrangian phase of ω with respect to α, which is described by the nonlinear elliptic equation

$$\sum_{i=1}^{n} \arctan(\lambda_i) = h(x)$$

where λ_i are the eigenvalues of ω with respect to α. When $h(x)$ is a topological constant, this equation corresponds to the deformed Hermitian-Yang-Mills (dHYM) equation, and is related by Mirror Symmetry to the existence of special Lagrangian submanifolds of the mirror. We introduce a notion of subsolution for this equation, and prove a priori $C^{2,\beta}$ estimates when $|h| > (n-2)\frac{\pi}{2}$ and a subsolution exists. Using the method of continuity we show that the dHYM equation admits a smooth solution in the supercritical phase case, whenever a subsolution exists. Finally, we discover some stability-type cohomological obstructions to the existence of solutions to the dHYM equation and we conjecture that when these obstructions vanish the dHYM equation admits a solution. We confirm this conjecture for complex surfaces. (Received August 13, 2015)