CORRECTION TO "CONVERGENCE PROPERTIES OF THE YANG-MILLS FLOW ON ALGEBRAIC SURFACES"

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The proof of Proposition 2.18 of [DW1] is incorrect. We apologize for this error and thank the referee of [DW2] for pointing out the mistake. As a consequence, the assumption $\mathrm{HYM}(D_j) \to \mathrm{HYM}(\vec{\mu}_0)$ in the statements of Theorems 2 and 5.1 of [DW1] should be replaced by the assumption $\mathrm{HYM}_\alpha(D_j) \to \mathrm{HYM}_\alpha(\vec{\mu}_0)$ for all $\alpha \in \{2\} \cup A$ where $A \subset [1, \infty)$ is a set containing an accumulation point.

The argument on page 97 should also be modified as follows: Let $D_{j,t}$ denote the solution to the YM flow equations with initial conditions D_j at time t. Then for a fixed $t_0 > 0$, $\|\Lambda F_{D_{j,t_0}}\|$ is uniformly bounded. Also,

$$\begin{aligned}
\|D_{j,t_0} - D_j\|_{L^2} &\leq \int_0^{t_0} \left\| \frac{\partial D_{j,s}}{\partial s} \right\|_{L^2} ds \leq t_0^{1/2} \left\{ \int_0^{t_0} \|D_{j,s}^* F_{D_{j,s}}\|_{L^2}^2 ds \right\}^{1/2} \\
&= (t_0/2)^{1/2} \left\{ \int_0^{t_0} (d/ds) \|F_{D_{j,s}}\|_{L^2}^2 ds \right\}^{1/2} \\
&= (t_0/2)^{1/2} \left\{ (\mathrm{YM}(D_j) - \mathrm{YM}(D_{j,t_0})) \right\}^{1/2} \longrightarrow 0 \ ,
\end{aligned}$$

since D_j is minimizing for Yang-Mills. This also implies that $\|D_{j,s}^* F_{D_{j,s}}\|_{L^2} \to 0$ for almost all $s > 0$, so we may assume from Proposition 2.11 that D_{j,t_0} has the same Uhlenbeck limit (E_∞, D_∞) as D_j and that this is a Yang-Mills connection. Similarly, since HYM_α decreases along the flow (Proposition 2.25), and by the additional assumption that $\mathrm{HYM}_\alpha(D_j)$ (hence also $\mathrm{HYM}_\alpha(D_{j,t_0})$) is minimizing for $\alpha \in A$, it follows from Propositions 2.24 (2) and 2.26 that the HN type of (E_∞, D_∞) coincides with that of (E, D_0). The Hypotheses 5.2 are now satisfied.

We note that for sequences along the Yang-Mills flow, the Hypotheses 5.2 are automatically satisfied (see Lemma 4.3). Also, in light of the results in [DW1, DW2], the statement of Proposition 2.18 is, indeed, correct.

References

[DW1] G. D. Daskalopoulos and R. A. Wentworth, Convergence properties of the Yang-Mills flow on Kähler surfaces. J. reine angew. Math. 575 (2004), 69–99.

[DW2] G. D. Daskalopoulos and R. A. Wentworth, On the blow-up set of the Yang-Mills flow on Kähler surfaces. Preprint, 2005.

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Date: August 10, 2006.