Conformal surfaces with bounds on their Willmore energy

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The Willmore integral of a closed surface $\Sigma \subset \mathbb{R}^n$ is the integral

$$\mathcal{W}(\Sigma) = \frac{1}{4} \int_{\Sigma} |\vec{H}|^2 \, \mathrm{d}\mu_g.$$

The integral is invariant under Möbius transformations of $\mathbb{R}^n$. We show that for a torus in $\mathbb{R}^3$ with $\mathcal{W}(\Sigma) \leq 8\pi - \delta$, the induced metric is uniformly equivalent to a flat metric with constant depending only on δ. We also discuss the higher genus case and the case $n = 4$. The results are joint work with Reiner Schätzle (Universität Tübingen).