# On the Existence of Minimal Tori in $S^3$ of Arbitrary Spectral Genus

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**Abstract**

In 1988, Hitchin showed that the data of a conformal structure $\tau$ on $T^2$, together with a generic harmonic map $f$ from $(T^2, \tau)$ to $S^3$, is equivalent to certain spectral data, including an algebraic curve. Thus there is a natural invariant one may associate to a pair $(\tau, f)$, namely the genus of its spectral curve. I prove that every value of this invariant is realised by some minimal immersion of a torus in $S^3$.