

Doubling constant mean curvature tori in S^3

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Abstract. The Clifford tori in S^3 constitute a one-parameter family of flat, two-dimensional, constant mean curvature (CMC) submanifolds. This paper demonstrates that new, topologically non-trivial CMC surfaces resembling a pair of neighbouring Clifford tori connected at a sub-lattice consisting of at least two points by small catenoidal bridges can be constructed by perturbative PDE methods. That is, one can create a submanifold that has almost everywhere constant mean curvature by gluing a re-scaled catenoid into the neighbourhood of each point of a sub-lattice of the Clifford torus; and then one can show that a constant mean curvature perturbation of this submanifold does exist.

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