

About the Catenoid Fence

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These singly periodic surfaces are parametrized (aa) by rectangular tori; our lines extend polar coordinates around the two punctures to the whole torus. The surfaces look like a fence of catenoids, joined by handles; they were made by Karcher and Hoffman, responding to the suggestive skew 4-noids. The morphing parameter aa is the modulus (a function of the length ratio) of the rectangular torus. Formulas are from [K2]

[K2] H. Karcher, Construction of minimal surfaces, in “Surveys in Geometry”, Univ. of Tokyo, 1989, and Lecture Notes No. 12, SFB 256, Bonn, 1989, pp. 1–96.

For a discussion of techniques for creating minimal surfaces with various qualitative features by appropriate choices of Weierstrass data, see either [KWH], or pages 192–217 of [DHKW].

[KWH] H. Karcher, F. Wei, and D. Hoffman, The genus one helicoid, and the minimal surfaces that led to its discovery, in “Global Analysis in Modern Mathematics, A Symposium in Honor of Richard Palais’ Sixtieth Birthday”, K. Uhlenbeck Editor, Publish or Perish Press, 1993

[DHKW] U. Dierkes, S. Hildebrand, A. Kuster, and O. Wohlrab, Minimal Surfaces I, Grundlehren der math. Wiss. v. 295 Springer-Verlag, 1991