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Eli Damon Cooper* (cooper@math.umass.edu), Department of Mathematics and Statistics,
Lederle Graduate Research Tower, University of Massachusetts at Amherst, Amherst, MA 01003.

The Area of the Disk of Unduloids which Share a Fixed Axis. Preliminary report.

With the exception of spheres, unduloids are the simplest examples of constant mean curvature (CMC) surfaces and the only other CMC surfaces of revolution. Kapouleas showed that unduloids can be cut and pasted to form more complex CMC surfaces and in this way, comprise the basic building blocks for a significant class of CMC surfaces. In order to get a handle on the geometry and topology of moduli spaces of such "cut-and-paste" surfaces, we study the basic building blocks of these surfaces, the unduloids themselves. To simplify the problem further, we focus on the unduloids that share a fixed axis of revolution.

Define \mathcal{U}_H to be those unduloids which have mean curvature H and the z -axis as their axis of revolution. Then \mathcal{U}_H is naturally parametrized by the unit disk and this parametrization gives rise to the (not quite global) polar coordinate system (e, θ) . Furthermore, \mathcal{U}_H possesses a canonical symplectic form which has a fairly simple coordinate expression relative to (e, θ) . This form can be integrated over \mathcal{U}_H to show that the total area of \mathcal{U}_H is finite. (Received September 05, 2006)