

# Errata and Addenda

for

Katsuei Kenmotsu's

## Surfaces with Constant Mean Curvature

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A few corrections, and addenda are given. We thank Shinya Hirakawa and Rafael López for pointing out such items.

### 1 Corrections

#### 1.1 Chapter 4. Helicoidal surfaces

page 59, last paragraph on page: "If we vary  $h$  while fixing other constants, then a rotational surface is isometrically deformed to a helicoidal surface preserving mean curvature  $H$  by (4.12)." is not correct, because  $U(s)$  in (4.11) depends on  $h$ . Nevertheless, the conclusion in the above sentence holds by considering a one-parameter family of those constants  $a, h$ , and  $m$ . The proof is given in Do Carmo and Dajczer [1]: In the family given in (4.11) of the text, we introduce new parameters  $(a_0, \theta)$  by setting :

$$\begin{aligned} a &= \frac{a_0 \cos \theta}{1 - 2a_0 H(1 - \cos \theta)} \\ h &= \frac{a_0 \sin \theta}{1 - 2a_0 H(1 - \cos \theta)} \\ m^2 &= \frac{1}{1 - 2a_0 H(1 - \cos \theta)}. \end{aligned}$$

Let us denote by  $U(a, h, m)$  the expression of  $U$  given by the last formula of (4.11). Fix  $a_0$  and  $\theta$ , and let  $a, h$ , and  $m$  be given by the above. Then for all  $\theta, 0 \leq \theta \leq 2\pi$ , we have

$$U(a, h, m) = U(a_0, 0, 1).$$

Hence, any helicoidal surface with constant mean curvature can be isometrically deformed from a rotational surface with the same mean curvature

## 1.2 Chapter 9. Intricate Constant Mean Curvature Surfaces

Page 111, last line of the hypothesis in Proposition 9.2: “Then, if the boundary  $\Gamma$  of  $S$  is symmetric with respect to the  $y$ -axis,” Add: “and a graph on the  $y$ -axis.”

Page 112, last sentence: “For example, the following holds [17].” Change the paper [17] to the paper by Earp, Brito, Meeks, and Rosenberg [2].

## 2 Addenda

Page 49, related to the last paragraph, the author has found a criterion for a periodic function to be the mean curvature function of some periodic surface of revolution. See [3] and [4].

Page 93, supplement to Proposition 7.4: For the equality case, the reference is Theorem 4 in the paper by Serrin [5].

## References

- [1] M. Do Carmo and M. Dajczer, Helicoidal surfaces with constant mean curvature, *Tohoku Math. J.* 34(1982), 425–435.
- [2] R. Earp, F. Brito, W. Meeks III, and H. Rosenberg, Structure theorems for constant mean curvature surfaces bounded by a planar curve, *Indiana Math. J.* 40(1991), 333-343.
- [3] K. Kenmotsu, Surfaces with periodic mean curvature, *Osaka J. Math.* 40(2003), 687-696.
- [4] K. Kenmotsu, Periodic mean curvature and Bézier curves, *Differential geometry and related topics*, World Sci. Publishing, NJ, 2002, 135-146.
- [5] J. Serrin, On surfaces of constant mean curvature which span a given space curve, *Math. Zeit.* 112(1969), 77-88.