

MR3817007 53A10 49Q05 53A07

Choe, Jaigyoung (KR-KIAS-NDM); **Hoppe, Jens** (S-RIT-NDM)

Higher dimensional Schwarz's surfaces and Scherk's surfaces. (English summary)

Calc. Var. Partial Differential Equations **57** (2018), no. 4, Art. 107, 17 pp.

In the article under review, the authors construct minimal hypersurfaces which are analogues of Schwarz P -surfaces, Schwarz D -surfaces and Scherk's second surfaces in Euclidean space. To this end, they first examine $(n - 1)$ -dimensional polyhedra with $2n$ faces. Applying their findings, they prove the existence of minimal hypersurfaces in Euclidean 4-space which generalize Schwarz P -surfaces, and they prove the existence of hypersurfaces which generalize Schwarz D -surfaces in Euclidean n -space.

To prove the existence of $(n - 1)$ -dimensional analogues of Scherk's second surface in Euclidean n -space, the authors introduce the catenoidal hypersurface and consider its upper half as barrier.

For completeness, the reader may wish to also consult a generalization of Scherk's first minimal surfaces that was presented almost three decades ago in [F. Dillen, L. Verstraelen and G. Zafindratafa, in *Differential geometry in honor of Radu Rosca*, 107–109, KU Leuven, Leuven, 1991; per reviewer].

Wendy Goemans

References

1. Blair, D.E.: On a generalization of the catenoid. *Can. J. Math.* **27**, 231–236 (1975) [MR0380637](#)
2. Choe, J.: On the existence of higher dimensional Enneper's surface. *Comment. Math. Helv.* **71**, 556–569 (1996) [MR1420510](#)
3. Choe, J., Hoppe, J.: Higher dimensional minimal submanifolds generalizing the catenoid and helicoid. *Tohoku Math. J.* **65**, 43–55 (2013) [MR3049639](#)
4. Harvey, R., Lawson, H.B.: Extending minimal varieties. *Invent. Math.* **28**, 209–226 (1975) [MR0370319](#)
5. Jenkins, H., Serrin, J.: The Dirichlet problem for the minimal surface equation in higher dimensions. *J. Reine Angew. Math.* **229**, 170–187 (1968) [MR0222467](#)
6. Karcher, H.: Embedded minimal surfaces derived from Scherk's examples. *Manuscr. Math.* **62**, 83–114 (1988) [MR0958255](#)
7. Pacard, F.: Higher dimensional Scherk's hypersurfaces. *J. Math. Pures Appl.* **81**, 241–258 (2002) [MR1894063](#)
8. Schwarz, H.A.: *Gesammelte Mathematische Abhandlungen*. Springer, Berlin (1890). Band I und II [MR0392470](#)

Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.