

Fu, Yu; Li, Lan

A class of Weingarten surfaces in Euclidean 3-space. (English) Zbl 1293.53007
Abstr. Appl. Anal. 2013, Article ID 398158, 6 p. (2013).

Summary: The class of biconservative surfaces in Euclidean 3-space \mathbb{E}^3 was defined by *R. Caddeo* et al. in [Ann. Mat. Pura Appl. (4) 193, No. 2, 529–550 (2014; [Zbl 1294.53006](#))] by the equation $A(\text{grad}H) = -H\text{grad}H$ for the mean curvature function H and the Weingarten operator A . In this paper, we consider the more general case that surfaces in \mathbb{E}^3 satisfying $A(\text{grad}H) = kH\text{grad}H$ for some constant k are called generalized bi-conservative surfaces. We show that this class of surfaces are linear Weingarten surfaces. We also give a complete classification of generalized bi-conservative surfaces in \mathbb{E}^3 .

MSC:

53A07 Higher-dimensional and n -codimensional surfaces in Euclidean and related n -spaces Cited in 1 Document

Keywords:

mean curvature; Weingarten operator; bi-conservative surfaces; linear Weingarten surfaces

Full Text: [DOI](#)

References:

- [1] Chen, B.-Y., Some open problems and conjectures on submanifolds of finite type, *Soochow Journal of Mathematics*, 17, 2, 169-188, (1991) · [Zbl 0749.53037](#)
- [2] Hasanis, T.; Vlachos, T., Hypersurfaces in (\mathbb{E}^4) with harmonic mean curvature vector field, *Mathematische Nachrichten*, 172, 145-169, (1995) · [Zbl 0839.53007](#)
- [3] Defever, F., Hypersurfaces of (\mathbb{E}^4) with harmonic mean curvature vector, *Mathematische Nachrichten*, 196, 61-69, (1998) · [Zbl 0944.53005](#)
- [4] Balmuş, A.; Montaldo, S.; Oniciuc, C., Classification results for biharmonic submanifolds in spheres, *Israel Journal of Mathematics*, 168, 201-220, (2008) · [Zbl 1172.58004](#)
- [5] Balmuş, A.; Montaldo, S.; Oniciuc, C., Biharmonic hypersurfaces in 4-dimensional space forms, *Mathematische Nachrichten*, 283, 12, 1696-1705, (2010) · [Zbl 1210.58013](#)
- [6] Caddeo, R.; Montaldo, S.; Oniciuc, C., Biharmonic submanifolds of (S^3) *International Journal of Mathematics*, 12, 8, 867-876, (2001) · [Zbl 1111.53302](#)
- [7] Caddeo, R.; Montaldo, S.; Oniciuc, C., Biharmonic submanifolds in spheres, *Israel Journal of Mathematics*, 130, 109-123, (2002) · [Zbl 1038.58011](#)
- [8] Chen, B.-Y., *Pseudo-Riemannian Geometry, δ -Invariants and Applications*, (2011), Hackensack, NJ, USA: World Scientific, Hackensack, NJ, USA
- [9] Dimitrić, I., Submanifolds of (\mathbb{E}^m) with harmonic mean curvature vector, *Bulletin of the Institute of Mathematics. Academia Sinica*, 20, 1, 53-65, (1992) · [Zbl 0778.53046](#)
- [10] López, R., On linear Weingarten surfaces, *International Journal of Mathematics*, 19, 4, 439-448, (2008) · [Zbl 1151.53005](#)
- [11] Montaldo, S.; Oniciuc, C., A short survey on biharmonic maps between Riemannian manifolds, *Revista de la Unión Matemática Argentina*, 47, 2, 1-22, (2006) · [Zbl 1140.58004](#)
- [12] Oniciuc, C., Biharmonic maps between Riemannian manifolds, *Analele Stiintifice ale Universitatii*, 48, 2, 237-248, (2002) · [Zbl 1061.58015](#)
- [13] Ou, Y.-L., Biharmonic hypersurfaces in Riemannian manifolds, *Pacific Journal of Mathematics*, 248, 1, 217-232, (2010) · [Zbl 1205.53066](#)
- [14] Caddeo, R.; Montaldo, S.; Oniciuc, C.; Piu, P., Surfaces in the three-dimensional space forms with divergence-free stress-bienergy tensor, *Annali di Matematica Pura ed Applicata*, (2012) · [Zbl 1294.53006](#)
- [15] Chen, B.-Y., *Geometry of Submanifolds*, (1973), New York, NY, USA: Marcel Dekker, New York, NY, USA

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.