

Characterizations of a Quaternionic Surface in Minkowski 3-Space.

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In this paper, we construct the quaternionic sea shell, which is a new surface in Minkowski 3-space. When principal normal of helical spiral is timelike, we show that the sea shell surface formed by helical spiral obtained spacelike unit quaternion defined by the principal normal of helical spiral. Then, this surface is recharacterized by the principal normal of helical spiral orthogonal two timelike unit quaternion. In addition to, we give a characterization of the sea shell surface with the principal normal of helical spiral orthogonal two spacelike unit quaternion.

References

- [1] G.L. Ashline, Z.M. Kadas, J.A.E. Monaghan, D.J. Mc-Cabe Modeling, *Seashell Morphology*, 2009.
- [2] J. K. Beem, E. P. Ehrlich, *Global Lorentzian Geometry*, Marcel Dekker. Inc., New York, 1981.
- [3] A.J. Hanson, *Quaternion Gauss Maps and Optimal framings of Curves and Surfaces*, Technical Report No:518, Indiana University, Indiana, 1998.
- [4] M.T. Sariaydin, *Characterization of Quaternionic Some Surfaces In Minkowski 3 Space*, PhD Thesis, Firat University.
- [5] M. Özdemir, A.A. Ergin, *Timelike Quaternion Frame of a Non-Lightlike Curve*, Beitr Age Zur Algebra Und Geometrie Contributions To Algebra And Geometry, 49(2) (2008), 325-333.