

Ding, Qing; Zhong, Shiping

The almost complex structure on \mathbb{S}^6 and related Schrödinger flows. (English) Zbl 1408.32025
Int. J. Math. 29, No. 14, Article ID 1850099, 21 p. (2018).

MSC:

32Q60 Almost complex manifolds

53C44 Geometric evolution equations (mean curvature flow, Ricci flow, etc.) (MSC2010)

Keywords:

almost complex structure; Schrödinger flow; G_2 -structure; octonions

Full Text: [DOI](#)

References:

- [1] Arms, R. J.; Hama, F. R., Localized-induction concept on a curved vortex and motion of elliptic vortex ring, Phys. Fluids, 8, 553-559, (1965)
- [2] Baez, J. C., The octonions, Bull. Amer. Math. Soc., 39, 145-206, (2002) · [Zbl 1026.17001](#)
- [3] Borel, A.; Serre, J. P., Groupes de Lie et puissances réduites de Steenrod, Amer. J. Math., 75, 409-448, (1953) · [Zbl 0050.39603](#)
- [4] Brower, B. C.; Kessler, D. A.; Koplik, J.; Levine, H., Geometrical models of interface evolution, Phys. Rev. A, 29, 1335-1342, (1984)
- [5] Bryant, R. L., Submanifolds and special structures on the octonions, J. Differential Geom., 17, 185-232, (1982) · [Zbl 0526.53055](#)
- [6] R. L. Bryant, S.-S. Chern's study of almost-complex structures on the 6-sphere, preprint (2014), arXiv:14053405.
- [7] Calabi, E., Construction and properties of some 6-dimensional almost complex manifolds, Trans. AMS, 87, 407-438, (1958) · [Zbl 0080.37601](#)
- [8] Calabi, E.; Gluck, H., What are the best almost complex structures on the 6-sphere?, Proc. Sympos. Pure Math., 54, 99-106, (1993) · [Zbl 0790.53036](#)
- [9] Da Rios, L. S., On the motion of an unbounded fluid with a vortex filament of any shape, Rend. Circ. Mat. Palermo., 22, 117-135, (1906)
- [10] Ding, Q., A note on the NLS and the Schrödinger flow of maps, Phys. Lett. A, 248, 49-56, (1998) · [Zbl 1115.35368](#)
- [11] Ding, Q.; He, Z. Z., The noncommutative KdV equation and its para-Kähler structure, Sci. China Math., 57, 1505-1516, (2014) · [Zbl 1302.37045](#)
- [12] Ding, Q.; Wang, Y. D., Geometric KdV flows, motions of curves and the third order system of the AKNS hierarchy, Int. J. Math., 22, 1013-1029, (2011) · [Zbl 1228.37048](#)
- [13] Ding, W. Y.; Wang, Y. D., Schrödinger flows of maps into symplectic manifolds, Sci. China A, 41, 746-755, (1998) · [Zbl 0918.53017](#)
- [14] Harvey, R.; Lawson, H. B., Calibrated geometries, Acta Math., 148, 47-157, (1982) · [Zbl 0584.53021](#)
- [15] Hasimoto, H., A soliton on a vortex filament, J. Fluid. Mech., 51, 477-485, (1972) · [Zbl 0237.76010](#)
- [16] Hashimoto, H.; Ohashi, M., Orthogonal almost complex structures of hypersurfaces of purely imaginary octonions, Hokkaido Math. J., 39, 351-387, (2010) · [Zbl 1206.53057](#)
- [17] Langer, J. S., Instabilities and pattern formation in crystal growth, Rev. Mod. Phys., 52, 1-28, (1980)
- [18] Langer, J.; Perline, R., Geometric realizations of Fordy-Kulish nonlinear Schrödinger systems, Pacific J. Math., 195, 157-178, (2000) · [Zbl 1115.37353](#)
- [19] LeBrun, C., Orthogonal complex structures on \mathbb{S}^6 , Proc. AMS, 101, 136-138, (1987) · [Zbl 0629.53037](#)
- [20] Meleshko, V. V.; Gourjii, A. A.; Krasnopolskaya, T. S., Vortex ring: History and state of the art, J. Math. Sci., 187, 772-806, (2012)
- [21] A. Nahmod, A. Stefanov and K. Uhlenbeck, On Schrödinger maps, *Comm. Pure Appl. Math.* (2003) 114-151; Erratum, On Schrödinger maps, *Comm. Pure Appl. Math.* (2004) 833-839.
- [22] Ohashi, M.; Adachi, T.; Hashimoto, H.; Hristov, M. J., Recent Progress in Diff. Geom. Related Fields, On G_2 -invariants of curves in purely imaginary octonions, 25-40, (2011), World Scientific Publishing
- [23] Ohashi, M., G_2 -congruence theorem for curves in purely imaginary octonions and its application, Geom. Dedicata, 163, 1-17, (2013) · [Zbl 1282.53042](#)
- [24] Ohashi, M.; Adachi, T.; Hashimoto, H.; Hristov, M. J., Current Developments in Differential Geom. Related Fields, A method

of determining the $SO(7)$ -invariants for curves in $\text{Im}(\mathbb{O})$ by their G_2 -invariants, 201-213, (2015), World Scientific Publishing

- [25] Saffman, P. G.; Taylor, G., The penetration of a fluid into a porous medium or Hale-Shaw cell containing a more visous, Proc. R. Soc. London A, 245, 312-329, (1958) · [Zbl 0086.41603](#)
- [26] Tang, Z., Curvature and integrability of an almost Hermitian structure, Inter. J. Math., 17, 97-105, (2006) · [Zbl 1111.53027](#)
- [27] Terng, C. L.; Uhlenbeck, K., Schrödinger flows on Grassmannians, AMS/IP Stud. Adv. Math., 36, 235-256, (2006) · [Zbl 1110.37056](#)

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.