

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/24880> holds various files of this Leiden University dissertation.

Author: Dalhuisen, Jan Willem

Title: The Robinson congruence in electrodynamics and general relativity

Issue Date: 2014-03-25

Bibliography

- [1] W. T. Irvine and D. Bouwmeester, *Linked and knotted beams of light*, Nature Physics **4**, 716 (2008).
- [2] A. F. Rañada, *A topological theory of the electromagnetic field*, letters in mathematical physics **18**, 97 (1989).
- [3] R. Penrose and W. Rindler, *Spinors and Space-time: Spinor and twistor methods in space-time geometry. volume 2*, Cambridge University Press, 1986 .
- [4] J. Dalhuisen and D. Bouwmeester, *Twistors and electromagnetic knots*, Journal of Physics A: Mathematical and Theoretical **45**, 135201 (2012).
- [5] W. T. Irvine, *Linked and knotted beams of light, conservation of helicity and the flow of null electromagnetic fields*, Journal of Physics A: Mathematical and Theoretical **43**, 385203 (2010).
- [6] W. Irvine, *Single photons in nonlinear photonic crystals and studies on electromagnetic knots*, thesis University Santa Barbara (2006).
- [7] I. Bialynicki-Birula, *Electromagnetic vortex lines riding atop null solutions of the Maxwell equations*, Journal of Optics A: Pure and Applied Optics **6**, S181 (2004).
- [8] I. Bialinicky-Birula, *private communication*, Warsaw (2010).
- [9] E. T. Newman, *Maxwell's equations and complex Minkowski space*, Journal of Mathematical Physics **14**, 102 (1973).
- [10] J. Swearngin, A. Thompson, A. Wickes, J. W. Dalhuisen, and D. Bouwmeester, *Linked Gravitational Radiation*, arXiv preprint arXiv:1302.1431 (2013).
- [11] J. Swearngin, *Linked Gravitational Radiation*, unpublished thesis University of Leiden (2012).
- [12] S. Chandrasekhar, *The mathematical theory of black holes*, Oxford University Press, 1998 .

- [13] G. Debney, R. Kerr, and A. Schild, *Solutions of the Einstein and Einstein-Maxwell Equations*, Journal of Mathematical Physics **10**, 1842 (1969).
- [14] M. Carmeli, *Group theory and general relativity: representations of the Lorentz group and their applications to the gravitational field*, Imperial College Press, 2000 .
- [15] R. Penrose, *Twistor algebra*, Journal of Mathematical physics **8**, 345 (1967).
- [16] E. Witten, *Perturbative gauge theory as a string theory in twistor space*, Communications in Mathematical Physics **252**, 189 (2004).
- [17] T. Adamo, M. Bullimore, L. Mason, and D. Skinner, *Scattering amplitudes and Wilson loops in twistor space*, Journal of Physics A: Mathematical and Theoretical **44**, 454008 (2011).
- [18] A. Zee, *Einstein Gravity in a Nutshell*, Princeton University Press, 2013 .
- [19] H. Hopf, *Über die Abbildungen der dreidimensionalen Sphäre auf die Kugelfläche*, Mathematische Annalen **104**, 637 (1931).
- [20] P. J. Hilton, *An introduction to homotopy theory*, Cambridge University Press, 1953 .
- [21] H. Urbantke, *The Hopf fibration - seven times in physics*, Journal of Geometry and Physics **46**, 125 (2003).
- [22] A. Hirsch, *Extension of the 'Villarceau-Section' to Surfaces of Revolution with a Generating Conic*, Journal for Geometry and Graphics **6**, 121 (2002).
- [23] H. Stachel, *Remarks on A. Hirsch's Paper concerning Villarceau Sections*, J. Geometry Graphics **6**, 133 (2002).
- [24] K.-J. Kim and M.-S. Kim, in *Proc. of Israel-Korea Bi-National Conference on New Themes in Computerized Geometrical Modeling, Tel-Aviv, Israel*, Citeseer (Postech, Israel, 1998), pp. 11–20.
- [25] D. Rolfsen, *Knots and links*, AMS Chelsea Pub., 2003 .
- [26] W. Fulton, *Algebraic topology: a first course*, Springer, 1995 .
- [27] S. A. Huggett and K. P. Tod, *An introduction to twistor theory*, Cambridge University Press, 1994 .
- [28] I. Robinson, *Null electromagnetic fields*, Journal of Mathematical Physics **2**, 290 (1961).
- [29] J. D. Jackson, *Classical Electrodynamics*, 3rd Edition 1999. Wiley-VCH .
- [30] E. T. Newman, *Heaven and its properties*, General Relativity and Gravitation **7**, 107 (1976).

-
- [31] E. Newman, *Complex coordinate transformations and the Schwarzschild-Kerr metrics*, Journal of Mathematical Physics **14**, 774 (1973).
- [32] E. T. Newman and J. Winicour, *A curiosity concerning angular momentum*, Journal of Mathematical Physics **15**, 1113 (1974).
- [33] E. T. Newman, *Classical, geometric origin of magnetic moments, spin-angular momentum, and the Dirac gyromagnetic ratio*, Physical Review D **65**, 104005 (2002).
- [34] R. W. Lind and E. T. Newman, *Complexification of the algebraically special gravitational fields*, Journal of Mathematical Physics **15**, 1103 (1974).
- [35] A. Burinskii, *The Dirac-Kerr-Newman electron*, Gravitation and Cosmology **14**, 109 (2008).
- [36] A. Burinskii and G. Magli, *Kerr-Schild approach to the boosted Kerr solution*, Physical Review D **61**, 044017 (2000).
- [37] B. Trishin, *unknown title, only available in Russian*, 2012 .
- [38] H. Kedia, I. Bialynicki-Birula, D. Peralta-Salas, and W. T. Irvine, *Tying Knots in Light Fields*, Physical Review Letters, 111, 150404, 2013 .
- [39] H. Bateman, *The conformal transformations of a space of four dimensions and their applications to geometrical optics*, Proceedings of the London Mathematical Society **2**, 70 (1909).
- [40] H. Bateman, *The transformation of the electrodynamical equations*, Proceedings of the London Mathematical Society **2**, 223 (1910).
- [41] H. Bateman, *The transformations of coordinates which can be used to transform one physical problem into another*, Proceedings of the London Mathematical Society **2**, 469 (1910).
- [42] E. Cunningham, *The principle of relativity in electrodynamics and an extension thereof*, Proceedings of the London Mathematical Society **2**, 77 (1910).
- [43] H. A. Kastrup, *On the advancements of conformal transformations and their associated symmetries in geometry and theoretical physics*, Annalen der Physik **17**, 631 (2008).
- [44] V. I. Fouchtchitch and A. G. Nikitin, *Symmetries of Maxwell's equations*, Springer, 1987 .
- [45] J. V. Narlikar, *Introduction to cosmology*, Cambridge University Press, 2nd edition, 1998 .
- [46] S. Lyle, *Self-Force and Inertia: Old Light on New Ideas*, Springer, Berlin, 2010, pp. 65-71 .

- [47] S. M. Carroll, *Spacetime and geometry. An introduction to general relativity*, Pearson, Addison Wesley, 2004 .
- [48] M. Tsamparlis, *Special relativity*, Springer, 2009 .
- [49] E.ourgoulhon, *Special Relativity in General Frames*, Springer, 2013 .
- [50] A. Barut, *Electrodynamics and classical theory of fields & particles*, Dover Publications (New York), 1980 .
- [51] H. Stephani, *Exact Solutions of Einstein's Field Equations*, Cambridge University Press, 2003, pp. 155-156 .
- [52] N. Van den Bergh, *Conformally Ricci flat Einstein-Maxwell solutions with a null electromagnetic field*, *General relativity and gravitation* **18**, 1105 (1986).
- [53] H. Bondi and T. Gold, *The field of a uniformly accelerated charge, with special reference to the problem of gravitational acceleration*, *Proceedings of the Royal Society of London. Series A. Mathematical and Physical Sciences* **229**, 416 (1955).
- [54] T. Fulton and F. Rohrlich, *Classical radiation from a uniformly accelerated charge*, *Annals of Physics* **9**, 499 (1960).
- [55] B. S. DeWitt and R. W. Brehme, *Radiation damping in a gravitational field*, *Annals of Physics* **9**, 220 (1960).
- [56] D. G. Boulware, *Radiation from a uniformly accelerated charge*, *Annals of Physics* **124**, 169 (1980).
- [57] S. Parrott, *Radiation from a uniformly accelerated charge and the equivalence principle*, *Foundations of Physics* **32**, 407 (2002).
- [58] S. Lyle, *Uniformly accelerating charged particles: a threat to equivalence principle*, Springer, 2008 .
- [59] S. Parrott, *Relativistic electrodynamics and differential geometry.*, Springer-Verlag, New York, 1987 .
- [60] L. P. Hughston and L. J. Mason, *A generalised Kerr-Robinson theorem*, *Classical and Quantum Gravity* **5**, 275 (1988).
- [61] D. Huybrechts, *Complex geometry-an introduction*, Springer, 2005 .
- [62] M. Carmeli and S. Malin, *Theory of spinors: an introduction*, World Scientific, 2000 .
- [63] R. Penrose and W. Rindler, *Spinors and Space-time: Spinor and twistor methods in space-time geometry. volume 1*, Cambridge University Press, 1984 .

-
- [64] R. Maartens and B. A. Bassett, *Gravito-electromagnetism*, *Classical and Quantum Gravity* **15**, 705 (1998).
- [65] H. Stephani, *Exact Solutions of Einstein's Field Equations*, Cambridge University Press, 2003 .
- [66] D. A. Nichols, R. Owen, F. Zhang, A. Zimmerman, J. Brink, Y. Chen, J. D. Kaplan, G. Lovelace, K. D. Matthews, M. A. Scheel, *et al.*, *Visualizing spacetime curvature via frame-drag vortexes and tidal tendexes: General theory and weak-gravity applications*, *Physical Review D* **84**, 124014 (2011).
- [67] W. Rindler, *The case against space dragging*, *Physics Letters A* **233**, 25 (1997).
- [68] W. Rindler, *Relativity: special, general, and cosmological*, Oxford University Press, 2nd edition, 2006 .
- [69] F. De Felice and D. Bini, *Classical Measurements in Curved Space-Times*, Cambridge University Press, 2010 .
- [70] W. Rindler, *Relativity: special, general, and cosmological*, Oxford University Press, 2nd edition, 2006, pp. 335-341 .
- [71] L. F. O. Costa and C. A. Herdeiro, *Gravitoelectromagnetic analogy based on tidal tensors*, *Physical Review D* **78**, 024021 (2008).
- [72] L. F. Costa and C. A. Herdeiro, *A gravito-electromagnetic analogy based on tidal tensors*, arXiv preprint gr-qc/0612140 (2006).
- [73] D. L. Wiltshire, M. Visser, and S. Scott, *The Kerr spacetime: Rotating black holes in general relativity*, Cambridge University Press Cambridge, 2009, p. 6 .
- [74] D. L. Wiltshire, M. Visser, and S. Scott, *The Kerr spacetime: Rotating black holes in general relativity*, Cambridge University Press Cambridge, 2009, p. 95 and p. 116 .
- [75] A. Burinskii, *Regular superconducting source of the Kerr-Newman solution*, arXiv preprint arXiv:1003.2928 (2010).
- [76] Kerr, *talk*, Marcell Grossmann meeting, Stockholm (2012).
- [77] B. O'Neill, *The geometry of Kerr black holes*, Wellesley, Mass. AK Peters, 1995 .
- [78] E. Newman and R. Penrose, *An approach to gravitational radiation by a method of spin coefficients*, *Journal of Mathematical Physics* **3**, 566 (1962).
- [79] J. Goldberg and R. Sachs, *Republication of: A theorem on Petrov types*, *General Relativity and Gravitation* **41**, 433 (2009).
- [80] R. P. Kerr, *Gravitational field of a spinning mass as an example of algebraically special metrics*, *Phys. Rev. Letters* **11**, (1963).

- [81] A. Burinskii, E. Elizalde, S. R. Hildebrandt, and G. Magli, *Regular sources of the Kerr-Schild class for rotating and nonrotating black hole solutions*, Physical Review D **65**, 064039 (2002).
- [82] A. Burinskii, *Kerr-Schild photonlike metric solutions*, arXiv preprint arXiv:0704.3184 (2007).
- [83] H. Stephani, *Exact Solutions of Einstein's Field Equations*, Cambridge University Press, 2003, pp. 493-494 .
- [84] H. Stephani, *Exact Solutions of Einstein's Field Equations*, Cambridge University Press, 2003, pp. 497-498 .
- [85] H. Stephani, *Exact Solutions of Einstein's Field Equations*, Cambridge University Press, 2003, pp. 492-493 .
- [86] H. Stephani, *Relativity: An introduction to special and general relativity*, Cambridge university press, 2004, pp. 294-295 .
- [87] W. Bonnor and P. Vaidya, *General Relativity, papers in honor of JL Synge, Edited by L. O'Raiheartaigh* (Dublin Institute for Advanced Studies) p **119**, (1972).
- [88] H. Stephani, *Exact Solutions of Einstein's Field Equations*, Cambridge University Press, 2003, pp. 487-489 .
- [89] A. Peres, *Null electromagnetic fields in general relativity theory*, Physical Review **118**, 1105 (1960).
- [90] W. Bonnor, *The gravitational field of light*, Communications in Mathematical Physics **13**, 163 (1969).
- [91] S. Lyle, *Uniformly accelerating charged particles: a threat to equivalence principle*, Springer, 2008, p. 256 .
- [92] J. B. Griffiths and J. Podolský, *Exact space-times in Einstein's general relativity*, Cambridge University Press, 2009 .
- [93] R. Geroch, A. Held, and R. Penrose, *A space-time calculus based on pairs of null directions*, Journal of Mathematical Physics **14**, 874 (1973).