

References

Agrawal, V. D. and G. G. Wong, "A high performance helical element for multiple access array on TDRSS spacecraft," IEEE AP-S Soc. Symposium Digest, Seattle, WA, 1979, pp. 481-484.

Angelakos, D. J. and D. Kajfez, "Modifications on the axial-mode helical antenna," *Proc. of the IEEE*, April 1967, pp. 558-559.

Barts, R. M. and W. L. Stutzman. Final Report "Support of Astron Phase II SBIR Proposal on Convert Antennas," Report No. EE SATCOM 96-6, Virginia Polytechnic Institute & State University, Blacksburg, VA, September 1996.

Brillouin, L. **Propagation in Periodic Structures**, New York: McGraw-Hill, 1946.

Burke, G. J., and A. J. Poggio, *Numerical Electromagnetics Code (NEC) - Method of Moments, Part I - Program Description - Theory*, Lawrence Livermore National Laboratory, January 1981.

Carver, K., "The Helicone - a circularly polarized antenna with low sidelobe level," *Proc. of the IEEE*, April 1967, p. 559.

Carver, K., "Polarization stability of the helical beam antenna," *IEEE Trans. Ant. and Propagat.*, September 1968, pp. 604-605.

Cha, A., "Wave propagation on helical antennas," *IEEE Trans. Ant. and Propag.*, Vol. AP-20, No. 5, September 1972, pp. 556-560.

Colburn, J. S. and Y. Rahmat-Samii, "Quadrifilar-curl antenna for the "Big-LEO" mobile satellite service system," IEEE AP-S Soc. Symposium Digest, Baltimore, MD, July, 1996, pp. 1088-1091.

Cumming, W. A., "A nonresonant endfire array for vhf and uhf," *IRE Trans. on Ant. and Prop.*, vol. AP-3, no. 2, April 1955, pp. 52-58.

Donn, C., "A new helical antenna design for better on- and off-boresight axial ratio performance," *IEEE Trans. Ant. and Propag.*, Vol AP-28, No. 2, March 1980, pp. 264-267.

Emerson, D. T., "The gain of an axial-mode helix antenna," *Antenna Compendium Volume 4*, ARRL, 1995, pp.64-68.

Emerson, D. T., "The gain of the axial-mode helix antenna: A numerical modeling study," unpublished manuscript, NRAO, November 1994, revised March 1995.

Fox, Neil D., **A Detailed Analysis of the Helical Array As A High Performance Portable Ground Station Antenna**, MSEE Thesis, Virginia Tech, 1988.

Gilmour, Jr, A. S., **Principles of Traveling Wave Tubes**, Artech House, Boston, MA, 1994.

Gittins, J. F., **Power Travelling-Wave Tubes**, American Elsevier Pub. Co., New York, 1965.

Haeff, A. V., U.S. Patent 2,064,469, filed October 23, 1933, issued December 15, 1936

Haef, A. V., U.S. Patent 2,233,126, filed October 23, 1933, issued February 25, 1941

Ho, Y. A., et al., "A 1x2 dielectric-loaded helical antenna array," IEEE AP-S Soc. Symposium Digest, Baltimore, MD, July, 1996, pp. 1962-1965.

Hui, H. T., Y. A. Ho, and Edward K. N. Yung, "A cylindrical DR rod antenna fed by a short helix," Proceedings AP-S International Symposium, Maryland, USA, 1996, pp. 1946-1949.

IEEE Standard Test Procedures for Antennas, ANSI/IEEE Std 149-1979, Section 11.2, The Institute of Electrical and Electronic Engineers, Inc., 1979.

Keen, K. M., "Low profile cavity antenna with small pitch angle helix feed," *Electronics Letters*, March 4, 1993, Vol. 29, No.5, pp. 501-502.

Kilgus, C. C., "Multi-element fractional turn helices," IEEE Trans. Ant. and Propagat., vol. AP-16, July 1968, pp. 499-500.

Kilgus, C. C., "Resonant quadrifilar helix," IEEE Trans. Ant. and Propagat., vol. AP-17, May 1969, pp. 349-351.

Kilgus, C. C., "Resonant quadrifilar helix design," *Microwave Journal*, Dec. 1970, pp. 49-54.

Kilgus, C. C., "Shaped-conical radiation pattern performance of the backfire quadrifilar helix," IEEE Trans. Ant. and Propagat., vol. AP-23, May 1975, pp. 391-397.

King, H. E. and J. L. Wong, "Characteristics of 1 to 8 wavelength uniform helical antennas," *IEEE Trans. Ant. and Propagat.*, Vol. AP-28, No. 2, March 1980, pp.291-296.

- Kompfner, R., "The traveling wave valve," *Wireless World*, vol. 52(3?), Nov. 1946, pp. 369-372.
- Kraus, J. D., "Helical beam antenna," *Electronics*, April, 1947.
- Kraus, J. D. and J. C. Williamson, "Characteristics of helical antennas radiating in the axial mode," *J. Appl. Physics*, vol 19, January 1948, pp. 87-96.
- Kraus, J. D., *Big Ear Two*, Cygnus-Quasar Books, Powell, OH, 1976.
- Kraus, J. D., "A 50-ohm input impedance for the helical beam antenna," *IEEE Trans. Ant. and Propag.*, Vol. AP-25, No. 6, November 1977, p. 913.
- Kraus, J. D., *Antennas*, 2nd edition, Chapter 7, McGraw-Hill, New York, NY, 1988.
- Kraus, J. D., "A helical-beam antenna without a ground plane," *IEEE Antennas and Propagation Magazine*, Vol. 37, No. 2, April 1995, p. 45.
- Kumar, A., "Fixed antennas for Inmarsat and MSAT applications," IEEE AP-S Soc. Symposium Digest, London, Ont., June 1991, pp.1544-1547.
- Lee, K.-F., et al, "Theory of the frequency response of uniform and quasi-taper helical antennas," *IEEE Trans. Ant. and Propagat.*, vol AP-30, no. 5, September 1982, pp. 1017-1021.
- Lee, K.-F. and P. F. Wong, "Directivities of helical antennas radiating in the axial mode," *IEE Proceedings*, Vol. 131, Pt. H, no. 2, p.121-122, April, 1984.
- Lindenblad, N. E., U.S. Patent #2,300,052, filed May 4, 1940, issued October 27, 1942.
- Ludwig, A. C., "A simple graph for determining polarization loss," *Microwave J.*, Vol. 19, Sept. 1976, p. 63.
- Maclean, T. S. M. and R. G. Kouyoumjian, "The bandwidth of helical antennas," *IRE Trans. on Ant. and Prop.*, vol. 7, December 1959, pp. 379-386.
- Marsh, J. A., "Current distributions on helical antennas," *Proc. I.R.E.*, vol. 39, June 1951, pp. 668-675.
- Maxwell, M. W., *Reflections: Transmission Lines and Antennas*, American Radio Relay League, Newington, CT, 1990.
- Mimaki, H. and H. Nakano, "Double pitch helical antenna," IEEE AP-S Soc. Inter.. Symo. Digest, Atlanta, June 1998, pp. 2320-2323.

Mitra, R., "Wave propagation on helices," *IEEE Trans. Ant. and Propag.*, Vol. AP-11, No. 5, September 1963, pp. 385-386.

Munk, B. A. and L. Peters, Jr., "A helical launcher for the helical antenna," *IEEE Trans. Ant. and Propag.*, Vol.16, May 1968, pp. 362-363.

Nakano, H., **Helical and Spiral Antennas: A Numerical Approach**, Research Studies Press, Letchworth, Hertfordshire, England; Wiley, New York, 1987.

Nakano, H., et al., "Radiation characteristics of short helical antenna and its mutual coupling," *Electronics Letters*, March 1, 1984, Vol. 20, No. 5, pp. 202-203.

Nakano, H., N. Asaka, and J. Yamauchi, "Radiation characteristics of short helical antenna and its mutual coupling," *Electronics Letters*, March 1, 1984, Vol. 20, No.5, pp. 202-203.

Nakano, H., et al., "Helical antenna with increased power gain," IEEE AP-S Soc. Symposium Digest, Boston, MA, June 1984, pp. 417-420.

Neureuther, A. R., P. W. Klock, and R. Mitra, "A study of the sheath helix with a conducting core and its application to the helical antenna." *IEEE Trans. Ant. and Propag.*, Vol. AP-15, No. 2, March 1967, pp.203-210.

Nghiem, D. et al., "Helical antenna tightly coupled to a conducting choke," URSI Radio Science Meeting Digest, Baltimore, MD, July 1996, p. 153

Pierce, J. R. and L. M. Field, "Theory of beam type traveling wave tube." *Proc. of I.R.E.*, vol. 35, February 1947, pp. 111-123.

Pierce, J. R., *Traveling Wave Tubes*, Van Nostrand, Princeton, NJ, 1950.

Safaai-Jazi, A. and J. C. Cardoso, "Radiation characteristics of a spherical helical antenna," *IEE Proc. - Microw. Antennas Propag.*, Vol. 143, No. 1, February 1996, pp. 7-12.

Sengupta, D. L., "The radiation characteristics of a zig-zag antenna," *IRE Trans. on Ant. and Prop.*, vol. AP-6, no. 2, April 1958, pp. 191-194.

Sensiper, S., "Electromagnetic wave propagation on helical structures (A review and survey of recent progress)," *Proc. I.R.E.*, vol. 47, February 1955, pp. 149-157.

Spall, J. M., et al., Final Report On "An Investigation of VHF/UHF Sheath Helix Antennas," Report No. SATCOM 94-6, Virginia Tech Satellite Communications Group, Virginia Tech, August 1994.

Stutzman, W. L. and G. A. Thiele, **Antenna Theory and Design**, Chapter 7, John Wiley & Sons, New York, 1981.

Sultan, N. et al., "Experimental validation of NEC analysis of software models of tape wound helical satellite antennas," IEEE AP-S Soc. Symposium Digest, Baltimore, MD, July, 1996, pp. 1700-1703.

Spall, J. M., W. L. Stutzman, and J. R. Nealy, Final Report on "An Investigation of VHF/UHF Sheath Helix Antennas," Report No. EE SATCOM 94-6, Virginia Polytechnic Institute & State University, Blacksburg, VA, August 1994.

Straw, R. D., Editor, **The ARRL Antenna Book**, Chapter 6, American Radio Relay League, Newington, CT, 1997.

Vaughan, R. G. and J. Bach Anderson, "Polarization properties of the axial mode helix antenna," *IEEE Trans. Ant. and Propagat.*, Vol. AP-33, No. 1, January 1985, pp. 10-20.

Wong, J. L. and H. E. King, "Broadband quasi-taper helical antennas," *IEEE Trans. Ant. and Propag.*, Vol. AP-27, No. 1, January 1979, pp. 72-78.

Wong, J. L. and H. E. King, "Empirical helix antenna design," IEEE AP-S Soc. Symposium Digest, Albuquerque, NM, May 1982, pp. 366-369.

Wong, J. Y. and S. C. Loh, "Radiation field of an elliptical helical antenna," *IRE Trans. on Antennas and Prop.*, vol 7, January 1959, pp. 46-52.

Wong, K.-L. and W.-S. Chen, "Study of an internally matched helical beam antenna," *IEEE Trans. on Ant. and Propagat.*, vol. 39, no. 6, June 1991, pp. 811-814.

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