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Spiral antenna with reconfigurable HIS using liquid crystals for monopulse radar application (Conference Paper)

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Abstract

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In this paper, the design of an electronically reconfigurable ground plane composed of a high impedance surface (HIS) based on liquid crystals is presented and used as a backing structure for a two-arm Archimedean spiral antenna. The structure is used to provide electronic switching of two different shaped radiation patterns for monopulse radar application; 1) sum-pattern (Σ -pattern), and 2) difference-pattern (Δ -pattern). The antenna arrangement is shown to exhibit either the Σ -or the Δ -beam by changing the permittivity (and hence reflection phase) of the HIS reflector when a bias voltage is applied between the periodic array and ground plane. The HIS is demonstrated to resonate at 6 GHz, and numerical results are employed to investigate the performance of the HIS-backed spiral arrangement, i.e. radiation pattern, impedance match, realized gain (Σ -pattern), and null depth (Δ -pattern). © 2017 IEEE.

Author keywords

direction-finding application high impedance surface (HIS) liquid crystals monopulse radar spiral antenna

Indexed keywords

Engineering controlled terms: Antenna arrays Antenna grounds Crystal structure Directional patterns (antenna) Impedance matching (electric) Liquid crystals Microwave antennas Monopulse radar Radar antennas Slot antennas

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- 1 Corzine, R.G., Mosko, J.A. (1990) *Four-Arm Spiral Antennas*. Cited 115 times. First Edition, Artech House Publishers
- 2 [Merck](#)
- 3 Jakoby, R., Scheele, P., Müller, S., Weil, C. Nonlinear dielectrics for tunable microwave components (2004) *15th International Conference on Microwaves, Radar and Wireless Communications, MIKON - 2004*, 2, pp. 369-378. Cited 32 times. ISBN: 8390666278; 978-839066627-3 [View at Publisher](#)
- 4 Ismail, M.Y., Hu, W., Cahill, R., Fusco, V.F., Gamble, H.S., Linton, D., Dickie, R., (...), Grant, N. Phase agile reflectarray cells based on liquid crystals (2007) *IET Microwaves, Antennas and Propagation*, 1 (4), pp. 809-814. Cited 23 times. doi: 10.1049/iet-map:20070061 [View at Publisher](#)
- 5 Hu, W., Dickie, R., Cahill, R., Gamble, H., Ismail, Y., Fusco, V., Linton, D., (...), Rea, S. Liquid crystal tunable mm wave frequency selective surface (2007) *IEEE Microwave and Wireless Components Letters*, 17 (9), pp. 667-669. Cited 69 times. doi: 10.1109/LMWC.2007.903455 [View at Publisher](#)
- 6 Christie, S., Cahill, R., Mitchell, N., Munro, Y., Manabe, A. Electronically scanned Rotman lens antenna with liquid crystal phase shifters (2013) *Electronics Letters*, 49 (7), pp. 486-488. Cited 3 times. doi: 10.1049/el.2013.0020 [View at Publisher](#)
- 7 Ito, N., Sakamoto, K., Arafune, R., Ushioda, S. Relation between the molecular orientations of a very thin liquid crystal layer and an underlying rubbed polyimide film (2000) *Journal of Applied Physics*, 88 (6), pp. 3235-3241. Cited 21 times. <http://scitation.aip.org/content/aip/journal/jap> doi: 10.1063/1.1288696 [View at Publisher](#)

- 8 Mohamad, S., Cahill, R., Fusco, V.
Selective high impedance surface active region loading of archimedean spiral antenna

(2014) *IEEE Antennas and Wireless Propagation Letters*, 13, art. no. 6782322, pp. 810-813. Cited 8 times.
doi: 10.1109/LAWP.2014.2314860

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- 9 *CST Microwave Studio*. Cited 441 times.
<https://www.cst.com>

- 10 Mushiake, Y.
Self-complementary antennas

(1992) *IEEE Antennas and Propagation Magazine*, 34 (6), pp. 23-29. Cited 151 times.
doi: 10.1109/74.180638

[View at Publisher](#)

- 11 Mohamad, S., Cahill, R., Fusco, V.
Tri-band HIS backed spiral antenna for wireless LAN applications

(2015) *Microwave and Optical Technology Letters*, 57 (5), pp. 1116-1121.
<http://www.interscience.wiley.com/jpages/0895-2477>
doi: 10.1002/mop.29028

[View at Publisher](#)

- 12 Mohamad, S., Cahill, R., Fusco, V.
Design of a cavity backed spiral antenna with improved pattern symmetry

(2013) *2013 7th European Conference on Antennas and Propagation, EuCAP 2013*, art. no. 6547055, pp. 3963-3967. Cited 10 times.
ISBN: 978-889070183-2

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