Scopus

Documents

Mohd Hamzah, S.Z.[a] , Malek, N.F.A.[a] , Ahamad, F.T.[a] , Mohamad, S.Y.[a] , Jamaluddin, M.H.[b]

Reflection Coefficient Variation based on the Configuration of Integrated Antenna and Reflecting Surface at 3.5 GHz
(2023) *2023 IEEE International Symposium on Antennas and Propagation, ISAP 2023*, .

[a] International Islamic University Malaysia, Microwave, Communication and Information System Engineering Research Group (MCISE RG), Electrical and Computer Engineering Department, Kulliyyah of Engineering, Kuala Lumpur, 53100, Malaysia
[b] University of Technology Malaysia, Wireless Communication Centre, Faculty of Electrical Engineering, Johor, Johor Bahru, 81310, Malaysia

Abstract
This work offers a low profile, and enhanced microstrip patch antenna for 5G and Wi-Max applications. The proposed design is based on a patch antenna embedded with reflective surface metamaterial consisting of an array of 5 × 5 elements. The simulated and measured of S11 has been observed to determine its performance. The advancement of Frequency Selective Surface (FSS) evolution known as Reflective Surface (RS) metamaterial has been adopted to integrate with the patch antenna. This design has a small size of 107 mm × 107 mm. Furthermore, it has been integrated with the microstrip patch antenna under two different configurations which provides a variation performance antenna in terms of reflection coefficient for both configuration 1 and configuration 2, at the operating frequency of 3.5 GHz. For configuration 1, no significant changes have been observed. While in configuration 2, the resonant frequency of the patch antenna has been shifted up and down with the best S11 is -40dB at 3.4 GHz © 2023 IEEE.

Author Keywords
FSS; patch; RS; WiMAX; wireless communication

References

- Tapio, V., Hemadeh, I., Mourad, A., Shojaeifard, A., Juntti, M.
  Survey on reconfigurable intelligent surfaces below 10 GHz
  (2021) *EURASIP J Wirel Commun Netw*, 2021 (1), p. 175.

- Sharma, T., Chehri, A., Fortier, P.
  Reconfigurable intelligent surfaces for 5G and beyond wireless communications: A comprehensive survey
  (2021) *Energies (Basel)*, 14 (24), p. 8219.

- Al-Tag, A.A.S., Al-Mahdi, R.M., Al-Hedari, M.B., Al-Ariqi, B.A., Al-Hetar, A.
  New Design of Intelligent Reflective Surface Based on Metamaterial Surface with Configurable Gain and Direction
  (2022) *2022 2nd International Conference on Emerging Smart Technologies and Applications (ESmarTA)*, pp. 1-5.

- Meng, X., Nekovee, M., Wu, D.
  (2019) *Reconfigurable Liquid Crystal Reflectarray Metasurface for THz Communications*,

- Foo, S.
  Liquid-crystal reconfigurable metasurface reflectors
  (2017) *2017 IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting, IEEE*, pp. 2069-2070.

- Sejan, M.A.S., Rahman, M.H., Shin, B.-S., Oh, J.-H., You, Y.-H., Song, H.-K.
  Machine Learning for Intelligent-Reflecting-Surface- Based Wireless Communication towards 6G: A Review
  (2022) *Sensors*, 22 (14), p. 5405.

- Azeman, M.A.
  (2022) *J. Phys.: Conf. Ser.*, p. 22.

Correspondence Address
Malek N.F.A.; International Islamic University Malaysia, Malaysia; email: norun@iium.edu.my