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Dual-band wearable fluidic antenna with metasurface embedded in a PDMS substrate

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Abstract A flexible fluidic antenna with an artificial magnetic conductor (AMC) plane is presented in this work. The overall structure is embedded in polydimethylsiloxane (PDMS), while the radiator is fabricated using eutectic gallium indium alloy (EGaIn) conductor. This radiator operating over an AMC plane is designed based on a rectangular patch which is integrated with slot and slits to enable dual-band WLAN ISM (2.4 and 5.8 GHz) operation, while maintaining a compact form. The integration of the AMC plane behind the proposed antenna reduced backward radiation towards the human users and improved gains. The evaluation of the antenna integrated with the AMC plane indicated satisfactory performance in terms of reflection coefficient, bandwidth and radiation patterns.

implementing a metasurface on the reverse side of the antenna [2, 3]. The most suitable metasurface for wearable antennas is the artificial magnetic conductor (AMC) metasurface, which is designed to filter propagation of a predefined sets of frequencies towards a certain direction. In recent years, more innovative solutions have been proposed to allow these AMC planes to be implemented on stretchable substrates [4, 5].

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