Dual band Circular Polarization Selector Using Asymmetric SRR Mirrors

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In this work we aim to design circularly polarized flat mirror/reflectarray to work at a dual frequency. The design approach uses a unit cell made by four assymetrical split-ring resonators with an opposite rotation plus an element size variation, a seen in Fig.1

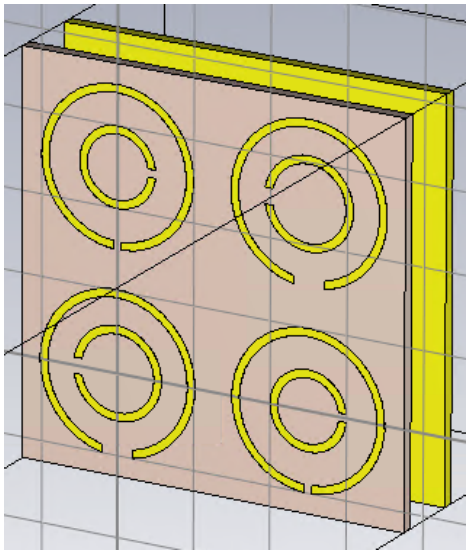

Fig. 1. Proposed structure (unit cell). The SRRs are made on copper on a FR4 substrate. There is a metallic (copper) plane mirror behind the structure. The inner rings have a radius of 5.8 mm (1st and 3rd quadrant) and 5mm (2nd and 4th quadrant). The outer rings have a radius of 10.2mm and 10mm, respectively.

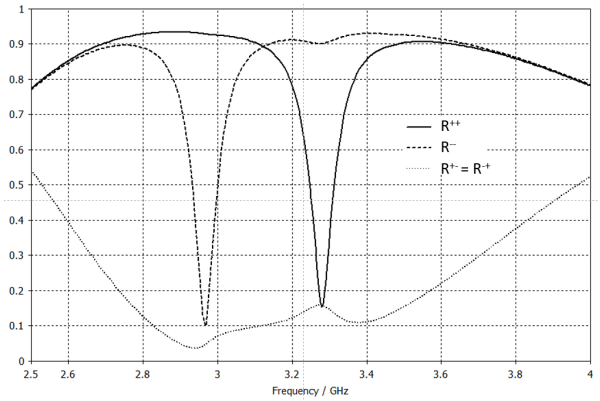

Fig. 2. Reflection coefficient for a circularly polarized wave normally incident on a structure as shown in Fig.1. The superindexes +/- stand for right-handed/left-handed circular polarized waves.

As we may see in Fig.2, the proposed structure presents a dual-band circular polarization selection: in the band around 2.97 GHz it absorbs LHCP incident waves while reflecting LHCP incident waves, doing the opposite around 3.28 GHz

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