

DESIGN OF CIRCULAR POLARIZED MICROSTRIP ANTENNA FOR REMOTE SENSING

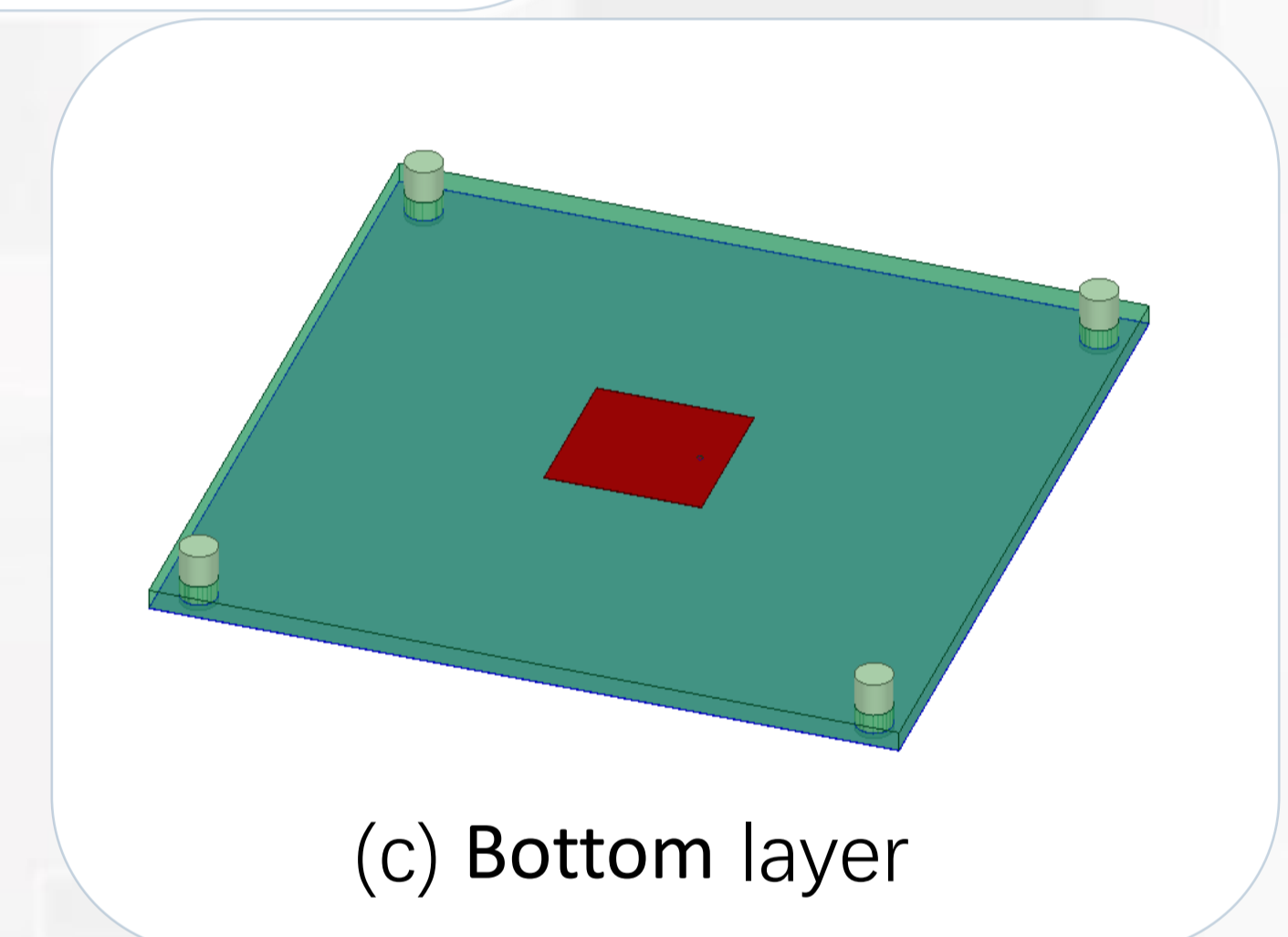
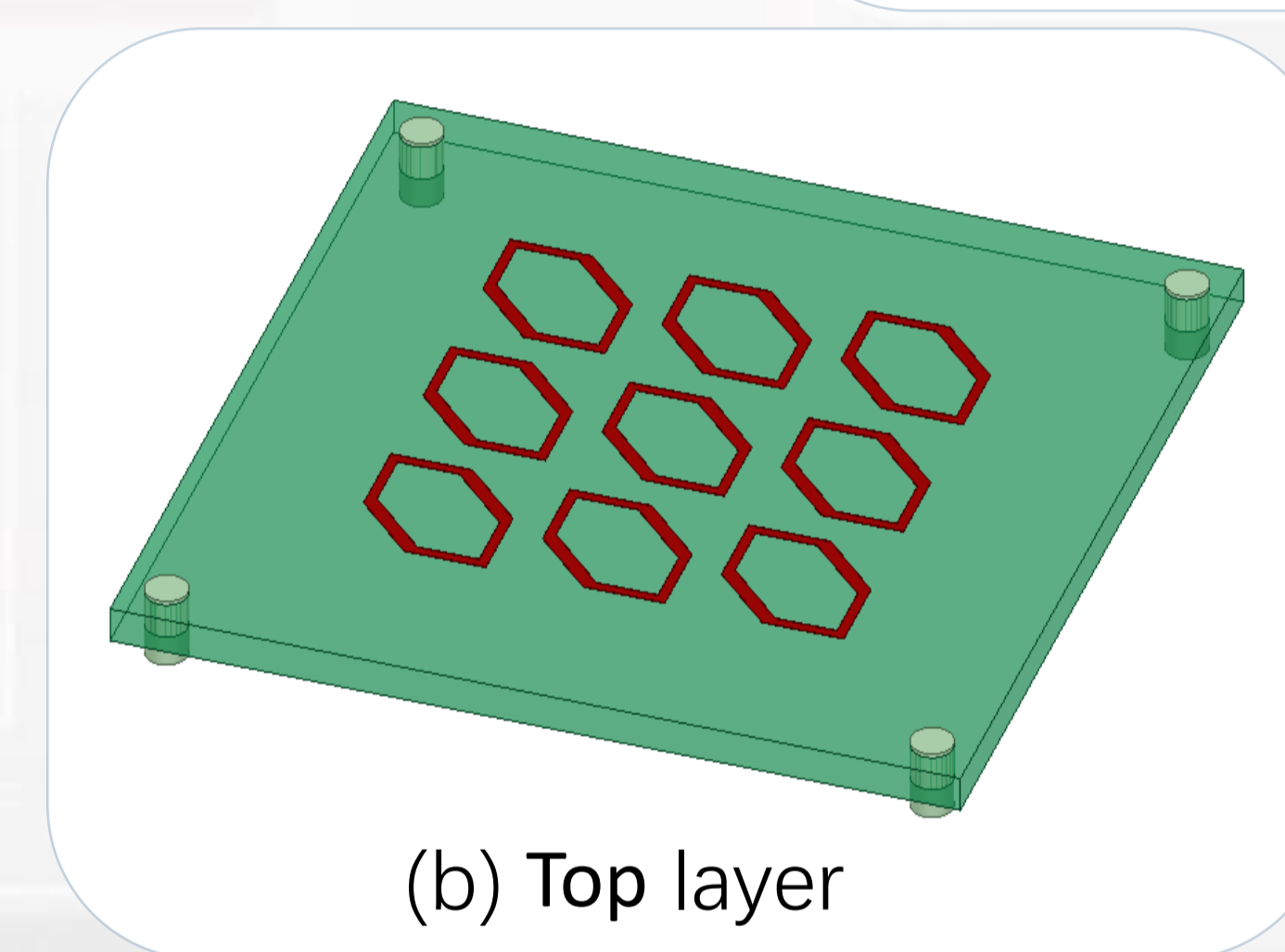
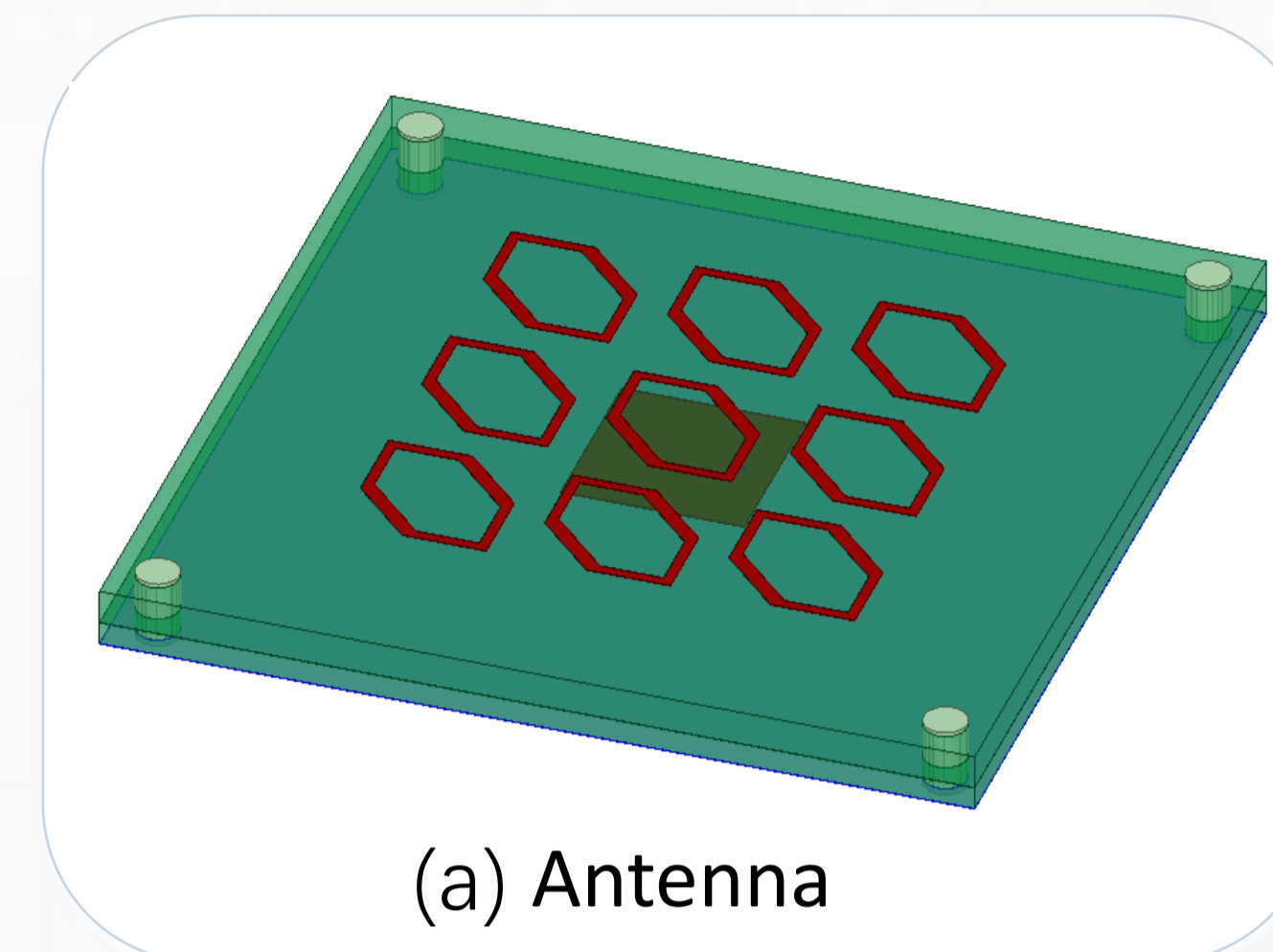
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The main result of this project is a 10GHz compact high-gain microstrip antenna with linear circular polarization conversion.

The overall structure of the antenna is divided into two layers, the metamaterial surface on the top and the ordinary linearly polarized rectangular microstrip antenna at the bottom. The innovative metamaterial surface successfully converts the linearly polarized waves of the antenna into circularly polarized waves, greatly improving the antenna's anti-interference ability. The metasurface is close to the rectangular microstrip antenna. Compared with Fabry-Perot antenna, this compact structure with no air gap can not only increase the antenna gain, but also further reduce the height of the antenna, thereby reducing the size of the antenna. It has the minimum S_{11} value on 10GHz, reaching -31.68dB . Its relative bandwidth is 7.7%, which is higher than that of the general circularly polarized microstrip antenna. Moreover, the antenna has a 2-dB minimum axis ratio at 10GHz and a 1.2% axis ratio bandwidth. Also, the antenna gain reaches the peak at 9.3dB.

The advantages of this design are small size, high gain, and relatively simple structure. In addition, as an innovative point, the metamaterial cover can increase the gain and realize the conversion of linear and circular polarization. Compared with the structure with a single-feed circularly polarized antenna as the primary antenna, this design effectively avoids the tedious optimization process of the circularly polarized antenna and directly simplifies the design process. Compared with the dual-feed circularly polarized antenna, this design does not need to add and design a complicated feed network, which prevents the antenna volume from increasing due to the addition of the feed network.