

# Design of a Silicon-based 160~320GHz tanh-profile wideband Corrugated Horn

Jie Hu<sup>1,2</sup>, Zheng Lou<sup>2</sup>, Hao-tian Zhu<sup>3</sup>, Wei-tao Lv<sup>2</sup>, Dong Liu<sup>2</sup> and Sheng-Cai Shi<sup>2</sup>

Abstract: This paper presents the design and simulation a silicon-based 160~320GHz wideband corrugated horn. The horn is formed by stacking 30 gold-coated silicon platelets [1]. The corrugation of the horn is formed by photography and deep reactive ion etching (DRIE). The tanh profile is chosen to make the horn compact as compact as possible [2]. The corrugated horn is simulated by a home-made mode matching script. The simulated beam patterns across the frequency band are shown in Fig. 1. It shows great symmetry and low sidelobe and cross-polarization level, which are below -35dB and -20dB respectively. The S11 is also below -20dB across the frequency band. The effect of the rectangular to circular waveguide transformation has also been taken into account.

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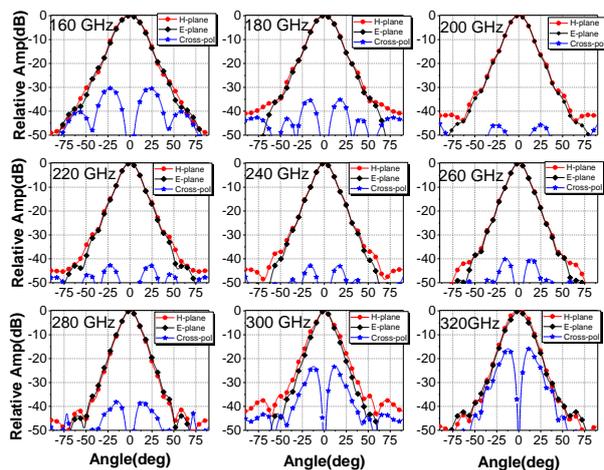


Fig. 1. Simulated far-field pattern of the corrugated horn. The black curves are E-plane, the red curves are H-plane and the blue curves are cross-polarization in D-plane.

## REFERENCES

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<sup>1</sup> APC, University Paris Diderot, Paris, 75013, France.

<sup>2</sup> Purple Mountain Observatory, 210032, Nanjing, China.

<sup>3</sup> LERMA, Observatoire de Paris, Paris, 75014, France.

## NOTES: