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Comment on “A waveguide slit array antenna fabricated with subwavelength periodic grooves Appl. Phys. Lett. 91, 143512 (2007)”

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In a recently published paper by Huang *et al.*,¹ the authors design a slit waveguide antenna based on a small central aperture on a metallic plate flanked by six straight grooves on each side. The authors defend the originality of their own design in comparison with our previous reports of a “bull’s eye” antenna based on a central slot surrounded by circular grooves (Ref. 12 in Ref. 1). They also include in their manuscript a citation to our first paper dealing with enhanced transmission-based antennas where we proposed a miniaturized prototype based on a central slot flanked by a straight groove on each side (Ref. 10 in Ref. 1). However, they identify this last work as an experimental proof of resonant excitation of surface plasmons (SPs) in the enhancement of transmission attained with these structures. Apart from the obvious fact that in the microwaves range this is not correct (since metals do not admit a plasmonic description there) and the enhancement is more appropriately linked with leaky waves, there is another important fact to be addressed.

The antenna designed by the authors is far from novel. Indeed, in our previous paper published in 2006 (Ref. 2) and in our patent,³ we discussed extensively an antenna that is essentially identical to that reported in Ref. 1. For instance, compare Figs. 4 and 7 in Ref. 2 and Fig. 1 in Ref. 1. Both

consist of a central slot on a metallic plane, fed by a waveguide, and surrounded by six grooves on each side. So, the claim posed in Ref. 1 about the novelty of using straight grooves is evidently incorrect. Moreover, most of the discussion presented in Ref. 1 was already present in Ref. 2, see the current distribution in Fig. 5 in Ref. 2 and Fig. 3 in Ref. 1 and also the radiation patterns of Figs. 6 and 10 in Ref. 2 and Fig. 2 in Ref. 1. In addition, the saturation of gain beyond six grooves stated in Ref. 1 was already present in our paper, see Table I in Ref. 2. Another important point is that we constructed and measured a prototype and could compare simulation results and experimental measurements, achieving a very good agreement.² However, in Ref. 1, only simulation results are given without any contrast with measurements. The only aspect shown in Ref. 1 and not considered in our previous works is the discussion dealing with multiple slits feeding the structure, Fig. 3 in Ref. 2.

In summary, we firmly think that it is proven that most of the ideas, results, and discussions presented in Ref. 1 were already present in our previous paper² and that the antenna design in Ref. 1 cannot be considered original at all since it is identical to our design. The only innovative aspect in Ref. 1 is the discussion about the multiple slit source. Anyway, our work offered a rich discussion contrasting simulation and experimental results.

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¹C. Huang, C. L. Du, and X. G. Luo, *Appl. Phys. Lett.* **91**, 143512 (2007).

²M. Beruete, I. Campillo, J. S. Dolado, J. E. Rodríguez-Seco, E. Perea, F. Falcone, and M. Sorolla, *IEEE Trans. Antennas Propag.* **54**, 340 (2006).

³Patent No. PCT/ES2004/000359.