

3-Faceted Array With Low Side Lobe Levels Using Tuneable Windows

Nurul H. Noordin, Tughrul Arslan, Brian Flynn

Advanced Smart Antenna Technologies Research Group, School of Engineering, The University of Edinburgh, EH9 3JL, UK
(N.Noordin, Brian.Flynn, Tughrul.Arslan)@ed.ac.uk

Abstract—In this paper, a 3-faceted phased array antenna synthesised for low side lobe levels using a tuneable window is presented. The array consists of eight left hand circularly polarised antennas. The phase difference of the antennas on the faceted structure is first compensated for and then an amplitude tapering method is used to synthesise the array to have a low sidelobe level, (SLL). The effect of the phase compensation on the angular scanning range of the 3-faceted array is then investigated. Simulation results show that the radiation patterns generated with tuneable windows, such as Kaiser, Chebyshev and Taylor, have a similar profile to the uniform amplitude distribution but with a much lower SLL and broader main beam. This technique enables the faceted structure to be synthesised for low SLL and at the same time retain its radiation pattern profile.

Index Terms—*Low Side-lobe level synthesis, amplitude tapering*