# Abstracts

## Constant flux illumination of square cells for millimeter-wave wireless communications

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The use of highly shaped-beam base-station antennas in millimeter-wave wireless communication systems may contribute to significantly enhance system performance. Previously proposed axial symmetric dielectric lenses provide a most useful constant-flux circular footprint, but they may fail to cover the regions near the vertices of square or rectangular cells, unless excessive wall illumination is allowed. This paper presents a simplified procedure to design shaped three-dimensional dielectric lenses that produce constant-flux illumination with square or rectangular footprints, suitable for indoor cells. The procedure is based on circular symmetric dielectric-lens design formulation, yet very sharp rectangular-cell boundary is obtained. Calculated and measured antenna performance is presented, not only in terms of radiation pattern, but also in terms of coverage and time-dispersion characteristic. The procedure is demonstrated for a square-cell lens and is extended for the rectangular-cell case.

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