THREE-DIMENSIONAL QUASI-STATIONARY ELECTROMAGNETIC FIELD GENERATED BY ARBITRARY CURRENT CONTOUR NEAR CONDUCTING BODY

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Abstract

The analytical method is developed to calculate the three-dimensional quasi-stationary electromagnetic field generated by arbitrary spatial current contour near the conducting body

with plane surface. By the use of displacement currents in dielectric region under quasi-stationary approximation, in addition to the results presented earlier, the solution for the scalar potential and electric intensity in entire dielectric half-space is found. Owing to the established fact of vertical zero components of the electric intensity and current density in conducting half-space, the electric field of surface charge compensates completely the vertical component of induced electric intensity of the initial current system. As an example, the electric intensity and surface electric charge density are calculated for the current contour configuration typical for technological systems. References 13, figures 3.

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