Re: E field Angle

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Hello DN and thanks for the reply...

Actually I am interested in AC/RF performance when a current is flowing through the conductor. (I'm sorry I did not mention that!)

.. I'm familiar with skin depth data and formulae, but the information doesn't seem to be applicable to the E field angle (or I do not understand how to interpret it in that way!)

The interface I am interested in is very simple −− metal −to − air (or vacuum).

Bill Miller

"Douglas Natelson" <natelson@xxxxxxxxxxxxxxxxxxxxxxx> wrote in message news:e95jfdeah1@xxxxxxxxxxxxxx

> Bill Miller wrote:
>
> > Theoretically, the Electrical (E) field associated with a conductor is at exactly 90 degrees with respect to that conductor.
>
> That's true for dc fields. The surface of the conductor is all at the same potential (if it wasn't, current would start to flow to screen out the potential differences). Since the E field is proportional to the gradient of the potential, it has to be normal to the conducting surface.
>
> > It appears, however, that real conductors behave diffeeently and that the E field associated with a real conductor is at an angle that is slightly displaced from 90 degrees.
>
> Only at nonzero frequencies.

> What are the parameters that govern this angle, and what is the range of angles that is likely to be encountered with typical conductors such as Cu, Al, Ag and others?What angular difference (if any) is there between a DC field and an AC field with the same peak V/M amplitude?

The complex dielectric function as a function of frequency is really what determines the boundary conditions. For truly dc fields, the field is locally normal to the surface. Try reading up on "skin depth" and related terms.

−−DN

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