$$\frac{\partial g(\xi,\eta)}{\partial x_r} = \mathcal{A}\left\{ z; H_e(x,y)\exp\left[ikr(x,y)\right]\frac{-ik(x-x_r)}{r(x,y)}\right\}. \tag{10}$$

Using Eq. (10) we can write Eq. (9) as

$$\begin{aligned}\frac{\partial S}{\partial x_r} = \sum \beta I(\xi,\eta)^{\beta-1}\, 2\,\mathrm{Re}\Big[& \mathcal{A}\left\{ z; H_e(x,y)\exp\left[ikr(x,y)\right]\right\}^{*} \\ & \times \mathcal{A}\left\{ z; H_e(x,y)\exp\left[i\phi_r(x,y)\right]\frac{-ik(x-x_r)}{r(x,y)}\right\}\Big]\end{aligned} \tag{11}$$

and similarly for $\partial S/\partial y_r$, replacing $(x-x_r)$ by $(y-y_r)$, and similarly for z_r, replacing $(x-x_r)$ by $-z_r$.

#146336- $15.00USD Received 20 Apr 2011;revised 31 May 2011;accepted 31 May 2011;published 6 Jun 2011