80. On the Singularities of the Riemann Functions of Mixed Problems for the Wave Equation in Plane-Stratified Media. II

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In this note we shall continue our study of the Riemann function of the mixed problem (1)–(5) in the previous note [1].

3. Expression of the secondary Riemann function $F(x,y)$ ($=F_l(x,y)$ in Ω_l). The $F_1(x,y)$ and $F_2(x,y)$ are given by the following formulas.

Case $0<y_n<h$.

$$(14)\quad \begin{aligned}(2\pi)^n F_1(x,y) &= \int_{S_m} \exp i\{\langle x'-y',\zeta'\rangle+(x_n-h)\lambda_1^+-y_n\xi_n\}Q(\zeta)\begin{vmatrix}B_1(-\lambda_1^+) & C_1(\lambda_2^+)\\ B_2(-\lambda_1^+) & C_2(\lambda_2^+)\end{vmatrix} \times d\zeta/R(\zeta')P_1(\zeta)\\ &+\int_{S_m} -\exp i\{\langle x'-y',\zeta'\rangle-(x_n-h)\lambda_1^+-y_n\xi_n\}Q(\zeta)\begin{vmatrix}B_1(\lambda_1^+) & C_1(\lambda_2^+)\\ B_2(\lambda_1^+) & C_2(\lambda_2^+)\end{vmatrix} \times d\zeta/R(\zeta')P_1(\zeta)\\ &+\int_{S_m} -\exp i\{\langle x'-y',\zeta'\rangle+x_n\lambda_1^+ +(h-y_n)\xi_n\}Q(-\lambda_1^+)\begin{vmatrix}B_1(\zeta) & C_1(\lambda_2^+)\\ B_2(\zeta) & C_2(\lambda_2^+)\end{vmatrix} \times d\zeta/R(\zeta')P_1(\zeta)\\ &+\int_{S_m} \exp i\{\langle x'-y',\zeta'\rangle-x_n\lambda_1^+ +(h-y_n)\xi_n\}Q(\lambda_1^+)\begin{vmatrix}B_1(\zeta) & C_1(\lambda_2^+)\\ B_2(\zeta) & C_2(\lambda_2^+)\end{vmatrix} \times d\zeta/R(\zeta')P_1(\zeta)\\ &\equiv F_{1,1}(x,y)+F_{1,2}(x,y)+F_{1,3}(x,y)+F_{1,4}(x,y), \qquad \text{respectively.}\end{aligned}$$

$$(15)\quad \begin{aligned}(2\pi)^n F_2(x,y) &= \int_{S_m} \exp i\{\langle x'-y',\zeta'\rangle+(x_n-h)\lambda_2^+-y_n\xi_n\}Q(\zeta)\begin{vmatrix}B_1(\lambda_1^+) & B_1(-\lambda_1^+)\\ B_2(\lambda_1^+) & B_2(-\lambda_1^+)\end{vmatrix} \times d\zeta/R(\zeta')P_1(\zeta)\\ &+\int_{S_m} \exp i\{\langle x'-y',\zeta'\rangle+(x_n-h)\lambda_2^+ +(h-y_n)\xi_n\}\\ &\quad\times\Big[\exp\{-ih\lambda_1^+\}Q(\lambda_1^+)\begin{vmatrix}B_1(-\lambda_1^+) & B_1(\zeta)\\ B_2(-\lambda_1^+) & B_2(\zeta)\end{vmatrix}\\ &\quad-\exp\{ih\lambda_1^+\}Q(-\lambda_1^+)\begin{vmatrix}B_1(\lambda_1^+) & B_1(\zeta)\\ B_2(\lambda_1^+) & B_2(\zeta)\end{vmatrix}\Big]d\zeta/R(\zeta')P_1(\zeta)\\ &\equiv F_{2,1}(x,y)+F_{2,2}(x,y) \qquad \text{respectively.}\end{aligned}$$

Case $y_n>h$.