If I calculate r with the formula

$$r = \frac{A_9 q_I(k_x) - A_{11}}{A_{12} - A_{10} q_I(k_x)} \qquad 1$$

With first calculating

$$A_5 = \frac{e^{i(k_x - k_x^{II})x'}(q_I(k_x) - q_{II}(k_x^{II}))}{q_{II}(k_x^{II}) - q_{II}(-k_x^{II})} \frac{\sqrt{1+|q_{II}(k_x^{II})|^2}}{\sqrt{1+|q_I(k_x)|^2}}$$

$$A_6 = \frac{e^{-i(k_x + k_x^{II})x'}(q_I(-k_x) - q_{II}(-k_x^{II}))}{q_{II}(k_x^{II}) - q_{II}(-k_x^{II})} \frac{\sqrt{1+|q_{II}(k_x^{II})|^2}}{\sqrt{1+|q_I(-k_x)|^2}}$$

$$A_7 = \frac{e^{i(k_x + k_x^{II})x'}(q_I(k_x) - q_{II}(k_x^{II}))}{q_{II}(-k_x^{II}) - q_{II}(k_x^{II})} \frac{\sqrt{1+|q_{II}(-k_x^{II})|^2}}{\sqrt{1+|q_I(k_x)|^2}}$$

$$A_8 = \frac{e^{i(k_x^{II} - k_x)x'}(q_I(-k_x) - q_{II}(k_x^{II}))}{q_{II}(-k_x^{II}) - q_{II}(k_x^{II})} \frac{\sqrt{1+|q_{II}(-k_x^{II})|^2}}{\sqrt{1+|q_I(-k_x)|^2}}$$

$$A_9 = A_5 \frac{e^{ik_x^{II}x''}}{\sqrt{1+|q_{II}(k_x^{II})|^2}} + A_7 \frac{e^{-ik_x^{II}x''}}{\sqrt{1+|q_{II}(-k_x^{II})|^2}}$$

$$A_{10} = A_6 \frac{e^{ik_x^{II}x''}}{\sqrt{1+|q_{II}(k_x^{II})|^2}} + A_8 \frac{e^{-ik_x^{II}x''}}{\sqrt{1+|q_{II}(-k_x^{II})|^2}}$$

$$A_{11} = A_5 \frac{e^{ik_x^{II}x''} q_{II}(k_x^{II})}{\sqrt{1+|q_{II}(k_x^{II})|^2}} + A_7 \frac{e^{-ik_x^{II}x''} q_{II}(-k_x^{II})}{\sqrt{1+|q_{II}(-k_x^{II})|^2}}$$

$$A_{12} = A_6 \frac{e^{ik_x^{II}x''} q_{II}(k_x^{II})}{\sqrt{1+|q_{II}(k_x^{II})|^2}} + A_8 \frac{e^{-ik_x^{II}x''} q_{II}(-k_x^{II})}{\sqrt{1+|q_{II}(-k_x^{II})|^2}}$$

And then

$$r = \frac{A_9 q_I(k_x) - A_{11}}{A_{12} - A_{10} q_I(k_x)}$$

The result is different from when I directly calculate r as below (which is exactly the same as 1).

$$r = -$$

$$\frac{e^{2i(k_x)x'}\left(q_I(k_x) - q_{II}(k_x^{II})\right)\sqrt{1+|q_I(-k_x)|^2} \quad \left([q_I(k_x) - q_{II}(k_x^{II})] - e^{2i(k_x^{II})(x'-x'')}[q_I(k_x) - q_{II}(-k_x^{II})]\right)}{\sqrt{1+|q_I(k_x)|^2}\left([q_I(k_x) - q_{II}(k_x^{II})]\left(q_I(-k_x) - q_{II}(-k_x^{II})\right) - e^{2i(k_x^{II})(x'-x'')}\left(q_I(-k_x) - q_{II}(k_x^{II})\right)[q_I(k_x) - q_{II}(-k_x^{II})]\right)}$$