In the presence of weak disorder of quenched Gaussian random fields

$$
\begin{aligned}
\mathcal{S}_{\mathrm{dis}} &= \int d^2 r d\tau \left[V(\mathbf{r})\, c^\dagger c + h(\mathbf{r})\, \phi\right] , \\
\overline{V(\mathbf{r})} = 0 \quad &; \quad \overline{V(\mathbf{r})V(\mathbf{r}')} = V_0^2\, \delta(\mathbf{r}-\mathbf{r}') , \\
\overline{h(\mathbf{r})} = 0 \quad &; \quad \overline{h(\mathbf{r})h(\mathbf{r}')} = h_0^2\, \delta(\mathbf{r}-\mathbf{r}') ,
\end{aligned}
$$

we obtain the resistivity for current along angle ϑ

$$
\rho(T) = \frac{1}{\chi^2_{\mathbf{J},\mathbf{P}}} \lim_{\omega\to 0} \int \frac{d^2 k}{(2\pi)^2}\, k^2 \cos^2(\theta_{\mathbf{k}} - \vartheta) \left(V_0^2\, \frac{\mathrm{Im}\, \Pi^R_{c^\dagger c}(\omega, \mathbf{k})}{\omega} + h_0^2\, \frac{\mathrm{Im}\, D^R_{\phi}(\omega, \mathbf{k})}{\omega} \right) .
$$