NCA again

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1 GO!

As funções de Green das pseudopartículas são

$$G_b(\omega) = \frac{1}{\omega - \lambda - \Sigma_b(\omega)}.$$

$$G_\sigma(\omega) = \frac{1}{\omega - \lambda - \epsilon_0 - \Sigma_\sigma(\omega)}.$$

$$G_a(\omega) = \frac{1}{\omega - \lambda - 2\epsilon_0 - U - \Sigma_a(\omega)}.$$

As auto-energias delas são

$$\Sigma_b(\omega) = \int_{-D}^{D} \frac{n_{\mathrm{F}}(\epsilon)\,\mathrm{d}\epsilon}{\pi} \Delta(\epsilon) \Big[G_\sigma(\epsilon + \omega) + G_{\overline{\sigma}}(\epsilon + \omega) \Big].$$

$$\Sigma_\sigma(\omega) = \int_{-D}^{D} \frac{n_{\mathrm{F}}(\epsilon)\,\mathrm{d}\epsilon}{\pi} \Big[\Delta(-\epsilon) G_b(\epsilon + \omega) + \Delta(\epsilon) G_a(\epsilon + \omega) \Big].$$

$$\Sigma_a(\omega) = \int_{-D}^{D} \frac{n_{\mathrm{F}}(\epsilon)\,\mathrm{d}\epsilon}{\pi} \Delta(-\epsilon) \Big[G_\sigma(\epsilon + \omega) + G_{\overline{\sigma}}(\epsilon + \omega) \Big].$$

Fazendo $\epsilon = \tilde{\epsilon} - \omega$:

$$\Sigma_b(\omega) = \int_{-D+\omega}^{D+\omega} \frac{n_{\mathrm{F}}(\epsilon - \omega)\,\mathrm{d}\epsilon}{\pi} \Delta(\epsilon - \omega) \Big[G_\sigma(\epsilon) + G_{\overline{\sigma}}(\epsilon) \Big].$$

$$\Sigma_\sigma(\omega) = \int_{-D+\omega}^{D+\omega} \frac{n_{\mathrm{F}}(\epsilon - \omega)\,\mathrm{d}\epsilon}{\pi} \Big[\Delta(-\epsilon + \omega) G_b(\epsilon) + \Delta(\epsilon - \omega) G_a(\epsilon) \Big].$$

$$\Sigma_a(\omega) = \int_{-D+\omega}^{D+\omega} \frac{n_{\mathrm{F}}(\epsilon - \omega)\,\mathrm{d}\epsilon}{\pi} \Delta(-\epsilon + \omega) \Big[G_\sigma(\epsilon) + G_{\overline{\sigma}}(\epsilon) \Big].$$

A função espectral da impureza é

$$\rho_\sigma(\omega) = -\frac{\mathrm{Im}\{K_\sigma(\omega)\}}{\pi} = \frac{\int_{-\infty}^{\infty} \mathrm{d}\epsilon\, e^{-\beta\epsilon} \Big[A_b(\epsilon) A_\sigma(\epsilon + \omega) + A_{\overline{\sigma}}(\epsilon) A_a(\epsilon + \omega) \Big]}{\int_{-\infty}^{\infty} \mathrm{d}\epsilon\, e^{-\beta\epsilon} \Big[A_b(\epsilon) + A_\sigma(\epsilon) + A_{\overline{\sigma}}(\epsilon) + A_a(\epsilon) \Big]}.$$