TABLE II

Interacting resonant-site Green functions and self-energies in the self-consistent Born approximation

Resonant-site Green functions:

$$(g_r(\omega))^{-1} = \omega - E_C + (\mathrm{W}_L^2/\mathrm{W})C(\epsilon_L) + (\mathrm{W}_R^2/\mathrm{W})C(\epsilon_R) - \sigma_r(\omega),$$
$$g_<(\omega) = |g_r(\omega)|^2[2f_L(\omega)\Gamma_L(\omega) + 2f_R(\omega)\Gamma_R(\omega) + \sigma_<(\omega)].$$

Self-energies:

$$\frac{\sigma_r(\omega)}{M^2} = -4\int\frac{d\omega'}{2\pi}\frac{g_<(\omega')}{\Omega} + P\int\frac{d\omega'}{2\pi}\left(\frac{g_>(\omega'-\Omega)+g_<(\omega'+\Omega)}{\omega-\omega'}\right) - i\frac{1}{2}\left(g_>(\omega-\Omega)+g_<(\omega+\Omega)\right),$$
$$\frac{\sigma_<(\omega)}{M^2} = g_<(\omega+\Omega).$$

Using:

$$\epsilon_{L/R} = \left(\frac{\omega - E_{L/R}}{2\mathrm{W}}\right),$$
$$C(\epsilon) = \begin{cases} [-\epsilon + \sqrt{\epsilon^2-1}], & \text{if } \epsilon > 1, \\ [-\epsilon + i\sqrt{1-\epsilon^2}], & \text{if } |\epsilon| < 1, \\ [-\epsilon - \sqrt{\epsilon^2-1}], & \text{if } \epsilon < -1. \end{cases}$$

$$\Gamma_{L/R}(\omega) = \Theta(1-|\epsilon_{L/R}|)\frac{\mathrm{W}_{L/R}^2}{\mathrm{W}}\sqrt{1-\epsilon_{L/R}^2},$$
$$f_{L/R}(\omega) = \frac{1}{e^{\beta(\omega-\mu_{L/R})}+1}.$$