energy tensor (5). Inserting the mode function (26) into (32) and taking the coincidence limit, one finds:

$$\begin{aligned}\langle 0|T_{00}(x)|0\rangle_{\text{ren}} =& \frac{1}{2}\int \frac{d^3k}{(2\pi)^3 a^2}(\chi_{\mathbf{k}}{}' - \frac{a'}{a}\chi_{\mathbf{k}})(\chi_{\mathbf{k}}{}^{*\prime} - \frac{a'}{a}\chi_{\mathbf{k}}{}^{*}) \\ &+ \left(k^2 + m^2a^2\right)\chi_{\mathbf{k}}\chi_{\mathbf{k}}{}^{*} + \tilde{T}, \end{aligned} \tag{34}$$

where $\tilde{T}$ signifies the plethora of additional terms arising from the renormalisation process that have no dependence on the variables $\mathcal{X}$. Minimising this with respect