

$$\begin{aligned} \frac{d\omega_b^2}{dt} = & (\gamma_L - \gamma_d)\omega_b^2 - \frac{\gamma_L}{2} \int_{t/2}^t dt_1 \int_{t-t_1}^{t_1} dt_2 (t-t_1)^2 \\ & e^{-\nu_a(2t-t_1-t_2)} \omega_b^2(t_1) \omega_b^2(t_2) \omega_b^2(t+t_2-t_1). \end{aligned} \quad (1)$$