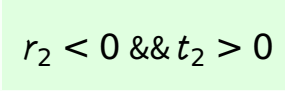


# Wave operator and propagator

$$\begin{aligned}
S = & \int \int \int \left( \frac{1}{6} f^{\alpha\beta} \tau_{\alpha\beta} + 6 \omega^{\alpha\beta\chi} \sigma_{\alpha\beta\chi} - 15 r_3 \partial_\beta \omega_{\gamma\theta} \partial' \omega_{\alpha\beta}^{\gamma\theta} + 9 r_3 \partial_\gamma \omega_{\beta\theta} \partial' \omega_{\alpha\beta}^{\gamma\theta} + \right. \\
& 9 r_3 \partial_\alpha \omega^{\alpha\beta\gamma} \partial_\theta \omega_{\beta\gamma}^{\theta} - 18 r_3 \partial' \omega_{\alpha\beta}^{\alpha\beta} \partial_\theta \omega_{\beta\gamma}^{\theta} - \\
& 15 r_3 \partial_\alpha \omega^{\alpha\beta\gamma} \partial_\theta \omega_{\gamma\beta}^{\theta} + 30 r_3 \partial' \omega_{\alpha\beta}^{\alpha\beta} \partial_\theta \omega_{\gamma\beta}^{\theta} + \\
& 4 t_2 \omega_{\gamma\theta\alpha} \partial^\theta f^{\alpha\gamma} + 2 t_2 \partial_{\alpha'} \omega_{\gamma\theta} \partial^\theta f^{\alpha\gamma} - t_2 \partial_{\alpha'} f^{\alpha\gamma} - t_2 \partial_{\theta'} f^{\alpha\gamma} - \\
& t_2 \partial_{\theta'} f^{\alpha\gamma} + t_2 \partial_{\theta'} f^{\alpha\gamma} - t_2 \partial_{\theta'} f^{\alpha\gamma} - t_2 \partial_{\theta'} f^{\alpha\gamma} - \\
& 4 t_2 \omega_{\alpha\theta\gamma} (\omega^{\alpha\gamma\theta} + \partial^\theta f^{\alpha\gamma}) + 2 t_2 \omega_{\alpha\theta\gamma} (\omega^{\alpha\gamma\theta} + 2 \partial^\theta f^{\alpha\gamma}) + \\
& 8 r_2 \partial_\beta \omega_{\alpha\theta} \partial^\theta \omega^{\alpha\beta\gamma} - 4 r_2 \partial_\beta \omega_{\alpha\theta} \partial^\theta \omega^{\alpha\beta\gamma} + \\
& 4 r_2 \partial_\beta \omega_{\gamma\theta\alpha} \partial^\theta \omega^{\alpha\beta\gamma} - 24 r_3 \partial_\beta \omega_{\gamma\theta\alpha} \partial^\theta \omega^{\alpha\beta\gamma} - \\
& 2 r_2 \partial_\gamma \omega_{\alpha\theta\beta} \partial^\theta \omega^{\alpha\beta\gamma} + 2 r_2 \partial_\gamma \omega_{\alpha\theta\beta} \partial^\theta \omega^{\alpha\beta\gamma} - \\
& \left. 4 r_2 \partial_\gamma \omega_{\alpha\theta\beta} \partial^\theta \omega^{\alpha\beta\gamma} \right) [t, x, y, z] dz dy dx dt
\end{aligned}$$

## Unitarity conditions



	$\omega_0^{+1}$	$f_0^{+1}$	$f_0^{+2}$	$\omega_0^{-1}$
$\omega_0^{+1} \uparrow$	0	0	0	0
$f_0^{+1} \uparrow$	0	0	0	0
$f_0^{+2} \uparrow$	0	0	0	0
$\omega_0^{-1} \uparrow$	0	0	0	$k^2 r_2 + t_2$