Large mixing matrix (spin-1 sector)

	$\sigma_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\sigma_{1^+}^{\#2}\dagger^{\alpha\beta}$	$\tau_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\sigma_{1^-}^{\#1}\dagger^{\alpha}$	$\sigma_{1^-}^{\#2}\dagger^{\alpha}$	$\tau_{1^-}^{\#1}\dagger^{\alpha}$	$\tau_{1^-}^{\#2}\dagger^{\alpha}$
$\tau_{1^-}^{\#2\,\alpha}$	0	0	0	$\dfrac{2ik}{t_1+2k^2t_1}$	$\dfrac{i\sqrt2\,k(2k^2r_1+t_1)}{(t_1+2k^2t_1)^2}$	0	$\dfrac{2k^2(2k^2r_1+t_1)}{(t_1+2k^2t_1)^2}$
$\tau_{1^-}^{\#1\,\alpha}$	0	0	0	0	0	0	0
$\sigma_{1^-}^{\#2\,\alpha}$	0	0	0	$\dfrac{\sqrt2}{t_1+2k^2t_1}$	$\dfrac{2k^2r_1+t_1}{(t_1+2k^2t_1)^2}$	0	$-\dfrac{i\sqrt2\,k(2k^2r_1+t_1)}{(t_1+2k^2t_1)^2}$
$\sigma_{1^-}^{\#1\,\alpha}$	0	0	0	0	$\dfrac{\sqrt2}{t_1+2k^2t_1}$	0	$-\dfrac{2ik}{t_1+2k^2t_1}$
$\tau_{1^+}^{\#1\,\alpha\beta}$	$-\dfrac{i\sqrt2\,k}{t_1+k^2t_1}$	$\dfrac{ik}{(1+k^2)t_1}$	$\dfrac{k^2}{(1+k^2)t_1}$	0	0	0	0
$\sigma_{1^+}^{\#2\,\alpha\beta}$	$-\dfrac{\sqrt2}{t_1+k^2t_1}$	$\dfrac{1}{(1+k^2)t_1}$	$\dfrac{ik}{(1+k^2)t_1}$	0	0	0	0
$\sigma_{1^+}^{\#1\,\alpha\beta}$	0	$-\dfrac{\sqrt2}{t_1+k^2t_1}$	$\dfrac{i\sqrt2\,k}{t_1+k^2t_1}$	0	0	0	0

$2^+ / 2^-$ sector

	$\sigma_{2^+}^{\#1}{}_{\alpha\beta}$	$\tau_{2^+}^{\#1}{}_{\alpha\beta}$	$\sigma_{2^-}^{\#1}{}_{\alpha\beta\chi}$
$\sigma_{2^+}^{\#1}\dagger^{\alpha\beta}$	$\dfrac{2}{(1+2k^2)^2t_1}$	$-\dfrac{2i\sqrt2\,k}{(1+2k^2)^2t_1}$	0
$\tau_{2^+}^{\#1}\dagger^{\alpha\beta}$	$\dfrac{2i\sqrt2\,k}{(1+2k^2)^2t_1}$	$\dfrac{4k^2}{(1+2k^2)^2t_1}$	0
$\sigma_{2^-}^{\#1}\dagger^{\alpha\beta\chi}$	0	0	$\dfrac{2}{2k^2r_1+t_1}$

$0^+ / 0^-$ sector

	$\omega_{0^+}^{\#1}$	$f_{0^+}^{\#1}$	$f_{0^+}^{\#2}$	$\omega_{0^-}^{\#1}$
$\omega_{0^+}^{\#1}\dagger$	$-t_1$	$i\sqrt2\,kt_1$	0	0
$f_{0^+}^{\#1}\dagger$	$-i\sqrt2\,kt_1$	$-2k^2t_1$	0	0
$f_{0^+}^{\#2}\dagger$	0	0	0	0
$\omega_{0^-}^{\#1}\dagger$	0	0	0	$-t_1$

Source constraints

SO(3) irreps	#
$\tau_{0^-}^{\#2}==0$	1
$\tau_{0^+}^{\#1}-2ik\,\sigma_{0^+}^{\#1}==0$	1
$\tau_{1^-}^{\#2\,\alpha}+2ik\,\sigma_{1^-}^{\#2\,\alpha}==0$	3
$\tau_{1^-}^{\#1\,\alpha}==0$	3
$\tau_{1^+}^{\#1\,\alpha\beta}+ik\,\sigma_{1^+}^{\#2\,\alpha\beta}==0$	3
$\tau_{2^+}^{\#1\,\alpha\beta}-2ik\,\sigma_{2^+}^{\#1\,\alpha\beta}==0$	5
Total #:	16

Spin-1 source/field block

	$\omega_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\omega_{1^+}^{\#2}\dagger^{\alpha\beta}$	$f_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\omega_{1^-}^{\#1}\dagger^{\alpha}$	$\omega_{1^-}^{\#2}\dagger^{\alpha}$	$f_{1^-}^{\#1}\dagger^{\alpha}$	$f_{1^-}^{\#2}\dagger^{\alpha}$
$f_{1^-}^{\#2\,\alpha}$	0	0	0	ikt_1	0	0	0
$f_{1^-}^{\#1\,\alpha}$	0	0	0	0	0	0	0
$\omega_{1^-}^{\#2\,\alpha}$	0	0	0	$\dfrac{t_1}{\sqrt2}$	0	0	0
$\omega_{1^-}^{\#1\,\alpha}$	0	0	0	$-k^2r_1-\dfrac{t_1}{2}$	$\dfrac{t_1}{\sqrt2}$	0	$-ikt_1$
$f_{1^+}^{\#1\,\alpha\beta}$	$\dfrac{ikt_1}{\sqrt2}$	0	0	0	0	0	0
$\omega_{1^+}^{\#2\,\alpha\beta}$	$\dfrac{t_1}{\sqrt2}$	0	0	0	0	0	0
$\omega_{1^+}^{\#1\,\alpha\beta}$	$-\dfrac{t_1}{2}$	$-\dfrac{t_1}{\sqrt2}$	$\dfrac{ikt_1}{\sqrt2}$	0	0	0	0

$2^+ / 2^-$ field block

	$\omega_{2^+}^{\#1}{}_{\alpha\beta}$	$f_{2^+}^{\#1}{}_{\alpha\beta}$	$\omega_{2^-}^{\#1}{}_{\alpha\beta\chi}$
$\omega_{2^+}^{\#1}\dagger^{\alpha\beta}$	$\dfrac{t_1}{2}$	$-\dfrac{ikt_1}{\sqrt2}$	0
$f_{2^+}^{\#1}\dagger^{\alpha\beta}$	$\dfrac{ikt_1}{\sqrt2}$	k^2t_1	0
$\omega_{2^-}^{\#1}\dagger^{\alpha\beta\chi}$	0	0	$k^2r_1+\dfrac{t_1}{2}$

$0^+ / 0^-$ field block

	$\sigma_{0^+}^{\#1}\dagger$	$\tau_{0^+}^{\#1}\dagger$	$\tau_{0^+}^{\#2}\dagger$	$\sigma_{0^-}^{\#1}\dagger$
$\sigma_{0^-}^{\#1}$	0	0	0	$-\dfrac{1}{t_1}$
$\tau_{0^+}^{\#2}$	0	0	0	0
$\tau_{0^+}^{\#1}$	$\dfrac{i\sqrt2\,k}{(1+2k^2)^2t_1}$	$\dfrac{2k^2}{(1+2k^2)^2t_1}$	0	0
$\sigma_{0^+}^{\#1}$	$-\dfrac{1}{(1+2k^2)^2t_1}$	$-\dfrac{i\sqrt2\,k}{(1+2k^2)^2t_1}$	0	0

Lagrangian density

$$
\begin{aligned}
&-t_1\,\omega_i{}^{\alpha l}\,\omega_{\kappa\alpha}{}^\kappa - t_1\,\omega_i{}^{\kappa\lambda}\,\omega_{\kappa\lambda}{}^i + f^{\alpha\beta}\,\tau_{\alpha\beta} + \omega^{\alpha\beta\chi}\,\sigma_{\alpha\beta\chi} + 2r_1\,\partial_i\omega^{\kappa\lambda}{}_\kappa\,\partial^l\omega_\lambda{}^\alpha{}_\alpha - \\
&\tfrac{2}{3}r_1\,\partial^\beta\omega^{\theta\alpha}{}_\theta\,\partial_\kappa\omega_{\alpha\beta}{}^\kappa - \tfrac{2}{3}r_1\,\partial_\theta\omega_{\alpha\beta}{}^\kappa\,\partial_\kappa\omega^{\theta\alpha\beta} + \tfrac{2}{3}r_1\,\partial_\theta\omega_{\alpha\beta}{}^\kappa\,\partial_\kappa\omega^{\theta\alpha\beta} + \\
&2r_1\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial_\kappa\omega^{\theta\kappa\lambda} - 2r_1\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial_\kappa\omega^{\theta\kappa\lambda} - \\
&4r_1\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial_\kappa\omega^{\kappa\lambda\theta} - \tfrac{1}{2}t_1\,\partial^\alpha f_{\theta\kappa}\,\partial^\kappa f_\alpha{}^\theta - \tfrac{1}{2}t_1\,\partial^\alpha f^\lambda{}_\kappa\,\partial^\kappa f_{\alpha\lambda} + \\
&t_1\,\omega_{\kappa\alpha}{}^\alpha\,\partial^\kappa f^l{}_i + t_1\,\omega_i{}_{\kappa}{}^\lambda\,\partial^\kappa f^l{}_\lambda - t_1\,\omega_{i\lambda}{}^\alpha\,\partial^\kappa f^l{}_\kappa + 2t_1\,\partial^\alpha f_{\kappa\alpha}\,\partial^\kappa f^l{}_i + 2t_1\,\omega_{l\kappa\theta}\,\partial^\kappa f^{l\theta} + \\
&t_1\,\omega_{l\alpha}{}^\alpha\,\partial^\kappa f^l{}_\kappa - t_1\,\omega_{i\lambda}{}^\alpha\,\partial^\kappa f_\alpha{}^\lambda + \tfrac{1}{2}t_1\,\partial_\alpha f^l{}_\kappa\,\partial^\kappa f_{\lambda\alpha} + \tfrac{1}{2}t_1\,\partial_\kappa f_\lambda{}^\alpha\,\partial^\kappa f_\lambda{}^\theta + \\
&\tfrac{1}{2}t_1\,\partial_\kappa f^\lambda{}_\theta\,\partial^\kappa f_\lambda{}^\theta - t_1\,\partial^\alpha f^\lambda{}_\alpha\,\partial^\kappa f_{\lambda\kappa} + \tfrac{2}{3}r_1\,\partial_\kappa\omega^{\alpha\beta\theta}\,\partial^\kappa\omega_{\alpha\beta\theta} - \\
&\tfrac{2}{3}r_1\,\partial^\beta\omega_i{}^{\alpha\lambda}\,\partial_\lambda\omega_{\alpha\beta}{}^i - \tfrac{8}{3}r_1\,\partial^\beta\omega^{\lambda\alpha}{}_i\,\partial_\lambda\omega_{\alpha\beta}{}^i - 2r_1\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial^\lambda\omega^{\theta\beta}{}_\kappa + 2r_1\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial^\lambda\omega^{\theta\beta}{}_\kappa
\end{aligned}
$$

Massive particle

$J^P = 2^-$, $\;k^\mu$

Massive particle	
Pole residue:	$-\dfrac{1}{r_1}>0$
Polarisations:	5
Square mass:	$-\dfrac{t_1}{2r_1}>0$
Spin:	2
Parity:	Odd

(No massless particles)

$r_1<0\ \&\&\ t_1>0$