

No - thermal leading order effects

$$c0 := \frac{-i \text{Re} + 2 \text{C15} \text{We1} (1 + \mu)}{2 \text{We1} (1 + \mu)};$$

$$c1 := - \frac{1}{128 \text{We1}^2 \mu (1 + \mu)^3}$$

$$\begin{aligned} & (i (24 \text{Re1}^3 \mu (1 + \rho) + 2 (\text{C14} - \text{C24}) \text{Gr1} \text{We1}^2 (1 + \mu) \\ & \quad (25 \text{C11} \mu^2 - 32 \text{C12} \mu^2 + (25 \text{C21} + 32 \text{C22}) \beta \rho^2) + \\ & \quad \text{Re1} \text{We1} (1 + \mu) \\ & \quad (-35 i \text{C11} \text{Gr1} \mu + 48 i \text{C12} \text{Gr1} \mu + 72 \text{C13} \text{C14} \text{We1} \mu^2 - \\ & \quad 64 \text{C14}^2 \text{We1} \mu^2 - 72 \text{C13} \text{C24} \text{We1} \mu^2 + 64 \text{C14} \text{C24} \text{We1} \mu^2 - \\ & \quad 96 \text{C14} \text{C15} \text{We1} \mu \rho + 72 \text{C14} \text{C23} \text{We1} \mu \rho + \\ & \quad 64 \text{C14} \text{C24} \text{We1} \mu \rho + 96 \text{C15} \text{C24} \text{We1} \mu \rho - \\ & \quad 72 \text{C23} \text{C24} \text{We1} \mu \rho - 64 \text{C24}^2 \text{We1} \mu \rho + 96 \text{C14} \text{C25} \text{We1} \mu \rho - \\ & \quad 96 \text{C24} \text{C25} \text{We1} \mu \rho - 35 i \text{C21} \text{Gr1} \beta \rho^2 - 48 i \text{C22} \text{Gr1} \beta \rho^2) - \\ & \quad 4 i \text{Re1}^2 \text{We1} \\ & \quad (15 \text{C13} \mu (1 + \mu) - 4 \text{C14} (9 \mu^2 - 2 \rho + \mu (4 + 3 \rho)) + \\ & \quad \mu (-3 (4 \text{C15} - 5 \text{C23} - 4 \text{C25}) (1 + \mu) \rho + \\ & \quad 4 \text{C24} (5 \mu + 7 \rho + 2 \mu \rho))))); \end{aligned}$$

First order thermal effects

$$c0 := \text{C15};$$

$$c1 := - \frac{1}{2048 \text{Re1} \text{We1} \alpha^2 (1 + \kappa) \mu (1 + \mu)^2}$$

$$\begin{aligned} & (768 \text{Gr1} \text{We1} \alpha^2 (\text{C12} - \text{C22} \kappa) \mu (1 + \mu) (1 + \beta \rho) + \\ & \quad (\text{C14} - \text{C24}) \text{Gr1} \text{Re1} \text{We1} \\ & \quad (-1024 i \text{C12} \alpha^2 \mu^2 + 480 \text{C17} \text{Pr1} \alpha^2 \mu^2 + \\ & \quad 450 \text{C12}^2 \text{Gr1} \text{Pr1}^2 \alpha^2 \mu^2 - 1024 i \text{C12} \alpha^2 \kappa \mu^2 + \\ & \quad 288 \text{C17} \text{Pr1} \alpha^2 \kappa \mu^2 + 390 \text{C12}^2 \text{Gr1} \text{Pr1}^2 \alpha^2 \kappa \mu^2 + \\ & \quad 105 \text{C21}^2 \text{Gr1} \text{Pr1}^2 \beta \kappa \rho + 180 \text{C21} \text{C22} \text{Gr1} \text{Pr1}^2 \beta \kappa \rho + \\ & \quad 60 \text{C22}^2 \text{Gr1} \text{Pr1}^2 \beta \kappa \rho + 192 \text{C17} \text{Pr1} \alpha^2 \beta \mu^2 \rho + \\ & \quad 60 \text{C12}^2 \text{Gr1} \text{Pr1}^2 \alpha^2 \beta \mu^2 \rho + 800 i \text{C21} \alpha^2 \beta \rho^2 + \\ & \quad 1024 i \text{C22} \alpha^2 \beta \rho^2 + 1050 \text{C21}^2 \text{Gr1} \text{Pr1}^2 \beta^2 \rho^2 + \\ & \quad 1470 \text{C21} \text{C22} \text{Gr1} \text{Pr1}^2 \beta^2 \rho^2 + 390 \text{C22}^2 \text{Gr1} \text{Pr1}^2 \beta^2 \rho^2 + \\ & \quad 800 i \text{C21} \alpha^2 \beta \kappa \rho^2 + 1024 i \text{C22} \alpha^2 \beta \kappa \rho^2 + \\ & \quad 1155 \text{C21}^2 \text{Gr1} \text{Pr1}^2 \beta^2 \kappa \rho^2 + 1650 \text{C21} \text{C22} \text{Gr1} \text{Pr1}^2 \beta^2 \kappa \rho^2 + \\ & \quad 450 \text{C22}^2 \text{Gr1} \text{Pr1}^2 \beta^2 \kappa \rho^2 + \\ & \quad 105 \text{C11}^2 \text{Gr1} \text{Pr1}^2 \alpha^2 \mu^2 (11 + 10 \kappa + \beta \rho) + \\ & \quad 96 \text{C27} \text{Pr1} \alpha \mu (3 \beta \rho + \kappa (2 + 5 \beta \rho)) - \\ & \quad 10 \text{C11} \alpha^2 \mu^2 \\ & \quad (-80 i (1 + \kappa) + 3 \text{C12} \text{Gr1} \text{Pr1}^2 (55 + 49 \kappa + 6 \beta \rho))) - \\ & \quad 2 \text{Re1}^2 \mu \\ & \quad (-3 (\text{C14} - \text{C24}) \text{Gr1} \text{Pr1}^2 \text{We1} \end{aligned}$$

$$\begin{aligned}
& (8 C22 (2 C23 (\kappa + 5 \beta \rho + 6 \beta \kappa \rho) + \\
& \quad 2 C25 (2 \kappa + 5 \beta \rho + 7 \beta \kappa \rho) + \\
& \quad C24 (3 \kappa + 11 \beta \rho + 14 \beta \kappa \rho)) + \\
& C21 (15 C23 (13 \beta \rho + \kappa (2 + 15 \beta \rho)) + \\
& \quad 8 (4 C24 (\kappa + 5 \beta \rho + 6 \beta \kappa \rho) + \\
& \quad \quad C25 (3 \kappa + 11 \beta \rho + 14 \beta \kappa \rho)))) - \\
\alpha^2 & (-64 i (-8 - 12 C15 C24 We1 \rho + 9 C23 C24 We1 \rho + \\
& \quad 8 C24^2 We1 \rho + C14 (12 C15 - 9 C23 - 8 C24 - 12 C25) \\
& \quad We1 \rho + 12 C24 C25 We1 \rho) + \\
\kappa & ((3 C13 (C14 - C24) (192 i + 195 C11 Gr1 Pr1^2 - \\
& \quad 80 C12 Gr1 Pr1^2) We1 - \\
& \quad 8 (-64 i + 33 C11 C15 C24 Gr1 Pr1^2 We1 - \\
& \quad 30 C12 C15 C24 Gr1 Pr1^2 We1 + \\
& \quad C14^2 (64 i + 60 C11 Gr1 Pr1^2 - \\
& \quad 33 C12 Gr1 Pr1^2) We1 + \\
& \quad C14 (3 (-11 C11 + 10 C12) C15 Gr1 Pr1^2 + \\
& \quad C24 (-64 i - 60 C11 Gr1 Pr1^2 + \\
& \quad 33 C12 Gr1 Pr1^2)) We1)) \mu - \\
& 64 i (-8 - 12 C15 C24 We1 \rho + 9 C23 C24 We1 \rho + \\
& \quad 8 C24^2 We1 \rho + C14 (12 C15 - 9 C23 - 8 C24 - \\
& \quad 12 C25) We1 \rho + 12 C24 C25 We1 \rho) + \\
\mu & (3 C13 (C14 - C24) We1 (15 C11 Gr1 Pr1^2 (15 + 2 \beta \rho) - \\
& \quad 16 (-12 i + C12 Gr1 Pr1^2 (6 + \beta \rho))) - \\
& \quad 8 (3 C11 C15 C24 Gr1 Pr1^2 We1 (14 + 3 \beta \rho) - \\
& \quad 2 (32 i + 3 C12 C15 C24 Gr1 Pr1^2 We1 (7 + 2 \beta \rho)) + \\
& \quad C14^2 We1 (64 i + 12 C11 Gr1 Pr1^2 (6 + \beta \rho) - \\
& \quad 3 C12 Gr1 Pr1^2 (14 + 3 \beta \rho)) + \\
& \quad C14 We1 (3 C15 Gr1 Pr1^2 \\
& \quad (2 C12 (7 + 2 \beta \rho) - C11 (14 + 3 \beta \rho)) + \\
& \quad C24 (-64 i - 12 C11 Gr1 Pr1^2 (6 + \beta \rho) + \\
& \quad 3 C12 Gr1 Pr1^2 (14 + 3 \beta \rho))))))));
\end{aligned}$$