

Summary of symmetry calculations

June 28, 2021

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Chapter 1

DBH_model

Run 11_24AM_25_June-2021

Degree in tangential ansätze: 2

The system of ODEs is given by:

$$\begin{aligned}\frac{dw_1}{dt} &= -w_1w_2 - w_1w_3 + w_2w_3, \\ \frac{dw_2}{dt} &= -w_1w_2 + w_1w_3 - w_2w_3, \\ \frac{dw_3}{dt} &= w_1w_2 - w_1w_3 - w_2w_3.\end{aligned}$$

The calculated generators are:

$$\begin{aligned}X_1 &= (1) \partial t, \\ X_2 &= (w_3) \partial t, \\ X_3 &= (w_2) \partial t, \\ X_4 &= (w_1) \partial t, \\ X_5 &= (1) \partial w_1, \\ X_6 &=, \\ X_7 &=, \\ X_8 &= (-t) \partial t, \\ X_9 &= (1) \partial w_2, \\ X_{10} &=, \\ X_{11} &= (-t) \partial t, \\ X_{12} &=, \\ X_{13} &= (t^2) \partial t + (1) \partial w_3, \\ X_{14} &= (t) \partial t, \\ X_{15} &=, \\ X_{16} &= \end{aligned}$$

Run 12_24PM_25_June-2021

Degree in tangential ansätze: 3

The system of ODEs is given by:

$$\begin{aligned}\frac{dw_1}{dt} &= -w_1w_2 - w_1w_3 + w_2w_3, \\ \frac{dw_2}{dt} &= -w_1w_2 + w_1w_3 - w_2w_3, \\ \frac{dw_3}{dt} &= w_1w_2 - w_1w_3 - w_2w_3.\end{aligned}$$

The calculated generators are:

$$\begin{aligned}
X_1 &= (1) \partial t, \\
X_2 &=, \\
X_3 &= (w_3^2) \partial t, \\
X_4 &=, \\
X_5 &=, \\
X_6 &= (w_2^2) \partial t, \\
X_7 &=, \\
X_8 &=, \\
X_9 &=, \\
X_{10} &= (w_1^2) \partial t, \\
X_{11} &= (1) \partial w_1, \\
X_{12} &=, \\
X_{13} &=, \\
X_{14} &=, \\
X_{15} &=, \\
X_{16} &=, \\
X_{17} &= (-t) \partial t, \\
X_{18} &=, \\
X_{19} &=, \\
X_{20} &=, \\
X_{21} &= (1) \partial w_2, \\
X_{22} &=, \\
X_{23} &=, \\
X_{24} &= (-t) \partial t, \\
X_{25} &=, \\
X_{26} &=, \\
X_{27} &=, \\
X_{28} &=, \\
X_{29} &=, \\
X_{30} &=, \\
X_{31} &= (t^2) \partial t + (1) \partial w_3, \\
X_{32} &= (t) \partial t, \\
X_{33} &=, \\
X_{34} &=, \\
X_{35} &=, \\
X_{36} &=, \\
X_{37} &=, \\
X_{38} &=, \\
X_{39} &=
\end{aligned}$$

Chapter 2

hydons_model

Run 11_20AM_25_June-2021

Degree in tangential ansätze: 1

The system of ODEs is given by:

$$\begin{aligned}\frac{dy_1}{dt} &= \frac{ty_1 + y_2^2}{-t^2 + y_1y_2}, \\ \frac{dy_2}{dt} &= \frac{ty_2 + y_1^2}{-t^2 + y_1y_2}.\end{aligned}$$

The calculated generators are:

$$X_1 = (t) \partial t + (y_1) \partial y_1 + (y_2) \partial y_2$$