Summary of symmetry calculations

July 1, 2021

Contents

Chapter 1

DBH_model

Run 11_24AM_25_June-2021

Degree in tangential ansätze: 2
The system of ODEs is given by:

$$\begin{aligned}
\frac{\mathrm{d}w_1}{\mathrm{d}t} &= -w_1w_2 - w_1w_3 + w_2w_3,\\
\frac{\mathrm{d}w_2}{\mathrm{d}t} &= -w_1w_2 + w_1w_3 - w_2w_3,\\
\frac{\mathrm{d}w_3}{\mathrm{d}t} &= w_1w_2 - w_1w_3 - w_2w_3.
\end{aligned}$$

The calculated generators are:

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

Run 12_24PM_25_June-2021

Degree in tangential ansätze: 3
The system of ODEs is given by:

$$\begin{aligned}
\frac{\mathrm{d}w_1}{\mathrm{d}t} &= -w_1w_2 - w_1w_3 + w_2w_3,\\
\frac{\mathrm{d}w_2}{\mathrm{d}t} &= -w_1w_2 + w_1w_3 - w_2w_3,\\
\frac{\mathrm{d}w_3}{\mathrm{d}t} &= w_1w_2 - w_1w_3 - w_2w_3.
\end{aligned}$$

The calculated generators are:

$$
\begin{aligned}
X_{1} &= (1)\,\partial t,\\
X_{2} &=,\\
X_{3} &= \left(w_{3}^{2}\right)\partial t,\\
X_{4} &=,\\
X_{5} &=,\\
X_{6} &= \left(w_{2}^{2}\right)\partial t,\\
X_{7} &=,\\
X_{8} &=,\\
X_{9} &=,\\
X_{10} &= \left(w_{1}^{2}\right)\partial t,\\
X_{11} &= (1)\,\partial w_{1},\\
X_{12} &=,\\
X_{13} &=,\\
X_{14} &=,\\
X_{15} &=,\\
X_{16} &=,\\
X_{17} &= (-t)\,\partial t,\\
X_{18} &=,\\
X_{19} &=,\\
X_{20} &=,\\
X_{21} &= (1)\,\partial w_{2},\\
X_{22} &=,\\
X_{23} &=,\\
X_{24} &= (-t)\,\partial t,\\
X_{25} &=,\\
X_{26} &=,\\
X_{27} &=,\\
X_{28} &=,\\
X_{29} &=,\\
X_{30} &=,\\
X_{31} &= \left(t^{2}\right)\partial t + (1)\,\partial w_{3},\\
X_{32} &= (t)\,\partial t,\\
X_{33} &=,\\
X_{34} &=,\\
X_{35} &=,\\
X_{36} &=,\\
X_{37} &=,\\
X_{38} &=,\\
X_{39} &=
\end{aligned}
$$

Chapter 2

hydons_model

Run 11_20AM_25_June-2021

Degree in tangential ansätze: 1
The system of ODEs is given by:

$$\frac{\mathrm{d}y_1}{\mathrm{d}t} = \frac{ty_1 + y_2^2}{-t^2 + y_1 y_2},$$
$$\frac{\mathrm{d}y_2}{\mathrm{d}t} = \frac{ty_2 + y_1^2}{-t^2 + y_1 y_2}.$$

The calculated generators are:

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

Run 11_06AM_01_July-2021

Degree in tangential ansätze: 1
The system of ODEs is given by:

$$\frac{\mathrm{d}y_1}{\mathrm{d}t} = \frac{ty_1 + y_2^2}{-t^2 + y_1 y_2},$$
$$\frac{\mathrm{d}y_2}{\mathrm{d}t} = \frac{ty_2 + y_1^2}{-t^2 + y_1 y_2}.$$

The calculated generators are:

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

Run 11_19AM_01_July-2021

Degree in tangential ansätze: 1
The system of ODEs is given by:

$$\frac{\mathrm{d}y_1}{\mathrm{d}t} = \frac{ty_1 + y_2^2}{-t^2 + y_1 y_2},$$
$$\frac{\mathrm{d}y_2}{\mathrm{d}t} = \frac{ty_2 + y_1^2}{-t^2 + y_1 y_2}.$$

The calculated generators are:

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