```
$Assumptions = {t ∈ ℝ, x ∈ ℝ, y ∈ ℝ, z ∈ ℝ, c > 0, a > 0, k > 0};
```

In[10]:=
```
n = 4;
coord = {t, x, y, z};
η = DiagonalMatrix[{-1, 1, 1, 1}];
h = Sin[k (x - t)] × DiagonalMatrix[{c, -c, a, -a}];
```

In[5]:=
```
η // MatrixForm // TraditionalForm
h // MatrixForm // TraditionalForm
```

Out[5]//TraditionalForm=

$$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

Out[6]//TraditionalForm=

$$\begin{pmatrix} c \sin(k (x-t)) & 0 & 0 & 0 \\ 0 & -c \sin(k (x-t)) & 0 & 0 \\ 0 & 0 & a \sin(k (x-t)) & 0 \\ 0 & 0 & 0 & -a \sin(k (x-t)) \end{pmatrix}$$

In[14]:=
```
linearRicci = Simplify[
   Table[(Sum[D[(η.h)[[s, i]], {coord[[s]], 1}], {coord[[j]], 1}] + D[(η.h)[[s, j]], {coord[[s]], 1},
         {coord[[i]], 1}], {s, 1, n}] - D[Tr[η.h], {coord[[i]], 1}, {coord[[j]], 1}] -
      Sum[η[[s, s]] × D[h[[i, j]], {coord[[s]], 2}], {s, 1, n}]) / 2, {i, 1, n}, {j, 1, n}]];
```

In[15]:=
```
linearRicci // MatrixForm // TraditionalForm
```

Out[15]//TraditionalForm=

$$\begin{pmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$