

## Coordinate conjugations for Metaclass IV

```
In[1]:= SetDirectory["~/writing/WIP/Conjugation/"];
<< kappaLib.m
```

KappaLib v1.1

```
In[3]:= mat1 = 
$$\begin{pmatrix} a1 & 0 & 0 & -b1 & 0 & 0 \\ 0 & a2 & 0 & 0 & -b2 & 0 \\ 0 & 0 & a3 & 0 & 0 & a4 \\ b1 & 0 & 0 & a1 & 0 & 0 \\ 0 & b2 & 0 & 0 & a2 & 0 \\ 0 & 0 & a4 & 0 & 0 & a3 \end{pmatrix};$$

```

```
In[4]:= H2 = 
$$\begin{pmatrix} 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \end{pmatrix};$$

```

```
H3 = 
$$\begin{pmatrix} 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & -1 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 & 0 & 0 \end{pmatrix};$$

```

```
In[6]:= kappa1 = emMatrixToKappa[mat1];
kappa2 = emMatrixToKappa[H2.mat1.H2];
kappa3 = emMatrixToKappa[H3.mat1.H3];
Union[Flatten[kappa2 - kappa3]]
```

Out[9]= {0}

```
In[10]:= L = DiagonalMatrix[{-1, 1, 1, 1}];
kappa2a = emCoordinateChange[kappa2, L];
emKappaToMatrix[kappa1] // MatrixForm
emKappaToMatrix[kappa2a] // MatrixForm
```

Out[12]/MatrixForm=

```

$$\begin{pmatrix} a1 & 0 & 0 & -b1 & 0 & 0 \\ 0 & a2 & 0 & 0 & -b2 & 0 \\ 0 & 0 & a3 & 0 & 0 & a4 \\ b1 & 0 & 0 & a1 & 0 & 0 \\ 0 & b2 & 0 & 0 & a2 & 0 \\ 0 & 0 & a4 & 0 & 0 & a3 \end{pmatrix}$$

```

Out[13]/MatrixForm=

```

$$\begin{pmatrix} a1 & 0 & 0 & -b1 & 0 & 0 \\ 0 & a2 & 0 & 0 & -b2 & 0 \\ 0 & 0 & a3 & 0 & 0 & -a4 \\ b1 & 0 & 0 & a1 & 0 & 0 \\ 0 & b2 & 0 & 0 & a2 & 0 \\ 0 & 0 & -a4 & 0 & 0 & a3 \end{pmatrix}$$

```

## ■ Check

```
In[14]= Union[Flatten[(kappa2a /. a4 → -a4) - kappa1]]
```

```
Out[14]= {0}
```