

```
In[1]:= SetDirectory["~/KappaLib"];
<< kappaLib-1.2.m
Loading KappaLib v1.2
```

■ Metaclass I representation of Lorentz Hodge operator + Axion

```
In[3]:= kappa = emMatrixToKappa [

$$\begin{pmatrix} a1 & 0 & 0 & -b1 & 0 & 0 \\ 0 & a2 & 0 & 0 & -b2 & 0 \\ 0 & 0 & a3 & 0 & 0 & -b3 \\ b1 & 0 & 0 & a1 & 0 & 0 \\ 0 & b2 & 0 & 0 & a2 & 0 \\ 0 & 0 & b3 & 0 & 0 & a3 \end{pmatrix}];$$

```

```
kappa = kappa /. {a2 -> a1, a3 -> a1, b3 -> b1, b2 -> b1};
```

```
In[5]:= emKappaToMatrix[kappa] // MatrixForm
```

Out[5]/MatrixForm=

```

$$\begin{pmatrix} a1 & 0 & 0 & -b1 & 0 & 0 \\ 0 & a1 & 0 & 0 & -b1 & 0 \\ 0 & 0 & a1 & 0 & 0 & -b1 \\ b1 & 0 & 0 & a1 & 0 & 0 \\ 0 & b1 & 0 & 0 & a1 & 0 \\ 0 & 0 & b1 & 0 & 0 & a1 \end{pmatrix}$$

```

```
In[6]:= g = DiagonalMatrix[{-1, 1, 1, 1}];
kappaAlt = -b1 emHodge[g] + a1 emIdentityKappa[];
```

```
In[8]:= Union[Flatten[kappaAlt - kappa]]
```

Out[8]= {0}