In[1]:=
```
SetDirectory["/www/user/fdahl/papers/Conjugation/"];
<< kappaLib.m
<< Petrov.m
```

```
KappaLib v1.1

Petrov routine loaded
```

- **Class I: (1bar(1) 1bar(1) 1bar(1))**

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

In[5]:=
$$V = \begin{pmatrix} \text{sigma1} & \text{tau1} & 0 & 0 & 0 & 0 \\ -\text{tau1} & \text{sigma1} & 0 & 0 & 0 & 0 \\ 0 & 0 & \text{sigma2} & \text{tau2} & 0 & 0 \\ 0 & 0 & -\text{tau2} & \text{sigma2} & 0 & 0 \\ 0 & 0 & 0 & 0 & \text{sigma3} & \text{tau3} \\ 0 & 0 & 0 & 0 & -\text{tau3} & \text{sigma3} \end{pmatrix};$$

In[6]:=
```
Eigenvalues[V]
```

Out[6]=
```
{sigma1 - i tau1, sigma1 + i tau1, sigma2 - i tau2,
 sigma2 + i tau2, sigma3 - i tau3, sigma3 + i tau3}
```

- **mathcal(W) contains only one element:**

In[7]:=
$$W = \begin{pmatrix} 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & 0 \end{pmatrix};$$

```
(* Check that W has signature (++++--)*)
Eigenvalues[W]
```

Out[8]=
```
{-1, -1, -1, 1, 1, 1}
```

In[9]:=
$$S = \text{Sqrt}[2]\, B. \begin{pmatrix} \frac{1}{\sqrt{2}} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{\sqrt{2}} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{\sqrt{2}} & 0 \\ 0 & \frac{1}{\sqrt{2}} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{\sqrt{2}} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{\sqrt{2}} \end{pmatrix};$$

- **Check that S is in set mathcal(S)**

In[10]:=
```
Transpose[S].B.S == W
```

Out[10]=
```
True
```

Compute result

In[11]:=
```
res = S.V.Inverse[S];
res // MatrixForm
```

Out[12]//MatrixForm=

$$\begin{pmatrix} \text{sigma1} & 0 & 0 & -\text{tau1} & 0 & 0 \\ 0 & \text{sigma2} & 0 & 0 & -\text{tau2} & 0 \\ 0 & 0 & \text{sigma3} & 0 & 0 & -\text{tau3} \\ \text{tau1} & 0 & 0 & \text{sigma1} & 0 & 0 \\ 0 & \text{tau2} & 0 & 0 & \text{sigma2} & 0 \\ 0 & 0 & \text{tau3} & 0 & 0 & \text{sigma3} \end{pmatrix}$$

In[13]:=
```
Petrov[res]
```

Out[13]//MatrixForm=

$$\begin{pmatrix} -\text{tau1} & 0 & 0 & 0 & 0 & \text{sigma1} \\ 0 & -\text{tau2} & 0 & 0 & \text{sigma2} & 0 \\ 0 & 0 & -\text{tau3} & \text{sigma3} & 0 & 0 \\ 0 & 0 & \text{sigma3} & \text{tau3} & 0 & 0 \\ 0 & \text{sigma2} & 0 & 0 & \text{tau2} & 0 \\ \text{sigma1} & 0 & 0 & 0 & 0 & \text{tau1} \end{pmatrix}$$

■ Export notebook as .pdf

In[14]:=
```
NotebookPrint[SelectedNotebook[],
 "/www/user/fdahl/papers/Conjugation/notebooks/ClassI.pdf"]
```