

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

KappaLib v1.1

Petrov routine loaded

■ **Class XIV: (2 2 1bar(1))**

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

$$\text{In[5]:= } \mathbf{V} = \begin{pmatrix} \text{lam1} & 1 & 0 & 0 & 0 & 0 \\ 0 & \text{lam1} & 0 & 0 & 0 & 0 \\ 0 & 0 & \text{lam2} & 1 & 0 & 0 \\ 0 & 0 & 0 & \text{lam2} & 0 & 0 \\ 0 & 0 & 0 & 0 & \text{sigma1} & \text{taul} \\ 0 & 0 & 0 & 0 & -\text{taul} & \text{sigma1} \end{pmatrix};$$

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

```
Out[6]= {lam1, lam1, lam2, lam2, sigma1 - i taul, sigma1 + i taul}
```

$$\text{In[7]:= } \mathbf{W} = \begin{pmatrix} 0 & \text{eps1} & 0 & 0 & 0 & 0 \\ \text{eps1} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \text{eps2} & 0 & 0 \\ 0 & 0 & \text{eps2} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & 0 \end{pmatrix};$$

■ **eps1 and eps2 have same block size, so we may assume that eps1 <= eps2:
Otherwise, all values for eps_i are possible.**

```
In[8]:= Sort[Eigenvalues[W] /. {eps1 -> -1, eps2 -> -1}]
Sort[Eigenvalues[W] /. {eps1 -> -1, eps2 -> 1}]
Sort[Eigenvalues[W] /. {eps1 -> 1, eps2 -> 1}]
```

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

```
Out[9]= {-1, -1, -1, 1, 1, 1}
```

```
Out[10]= {-1, -1, -1, 1, 1, 1}
```

```
In[11]:= (* See ClassXIV_Solve.nb *)
```

$$\mathbf{S} = \begin{pmatrix} 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & \text{eps2} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ \text{eps1} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \end{pmatrix};$$

■ Check that S is in set $\text{mathcal{S}}$

```
In[12]:= Transpose[S].B.S == W
```

```
Out[12]= True
```

■ Compute result

```
In[13]:= res = S.V.Inverse[S];
res // MatrixForm
```

```
Out[14]//MatrixForm=
```

$$\begin{pmatrix} \text{lam1} & 0 & 0 & 0 & 0 & 0 \\ 0 & \text{lam2} & 0 & 0 & \text{eps2} & 0 \\ 0 & 0 & \text{sigma1} & 0 & 0 & -\text{tau1} \\ \text{eps1} & 0 & 0 & \text{lam1} & 0 & 0 \\ 0 & 0 & 0 & 0 & \text{lam2} & 0 \\ 0 & 0 & \text{tau1} & 0 & 0 & \text{sigma1} \end{pmatrix}$$

```
In[15]:= Petrov[res]
```

```
Out[15]//MatrixForm=
```

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & \text{lam1} \\ 0 & \text{eps2} & 0 & 0 & \text{lam2} & 0 \\ 0 & 0 & -\text{tau1} & \text{sigma1} & 0 & 0 \\ 0 & 0 & \text{sigma1} & \text{tau1} & 0 & 0 \\ 0 & \text{lam2} & 0 & 0 & 0 & 0 \\ \text{lam1} & 0 & 0 & 0 & 0 & \text{eps1} \end{pmatrix}$$

■ Export notebook as .pdf

```
In[16]:= NotebookPrint[SelectedNotebook[],
"/www/user/fdahl/papers/Conjugation/notebooks/ClassXIV.pdf"]
```