In[453]:=
```
Block[{A0, A1, A2, A3, Aτ, κ0, κ1, κ2, κ3, M1, M2, ME, ML, σS, σn, σν},
 $MinPrecision = prec;
 A0 = SetPrecision[TeV, prec];
 A2 = -SetPrecision[TeV, prec];
 A3 = -SetPrecision[TeV, prec];
 Aτ = SetPrecision[TeV, prec];
 A1[i_] := -SetPrecision[κ1[i] TeV, prec];
 κ0 = SetPrecision[0.4, prec];
 κ1[i_] := SetPrecision[10^-5, prec];
 κ2 = SetPrecision[0.5, prec];
 κ3 = SetPrecision[0.6, prec];
 M1 = SetPrecision[350 GeV, prec];
 M2 = SetPrecision[500 GeV, prec];
 σS = SetPrecision[TeV, prec];
 σn[3] = SetPrecision[TeV, prec];
 σν[1] = SetPrecision[0.19 MeV, prec];
 σν[2] = SetPrecision[0.14 MeV, prec];
 σν[3] = SetPrecision[0.15 MeV, prec];
 ME[3, 3] = ML[1, 2] = ML[1, 3] = ML[2, 3] = SetPrecision[TeV, prec];
 {valSNe, vecSNe} = Eigensystem[TE];
 {valSNo, vecSNo} = Eigensystem[TO];
 {valSC, vecSC} = Eigensystem[TC];
 valFN = Sqrt[Eigenvalues[Mneχ.Transpose[Conjugate[Mneχ]]]];
 vecFN = Inverse[Transpose[Eigenvectors[Mneχ.Transpose[Conjugate[Mneχ]]]]];
 valFC = Sqrt[Eigenvalues[Conjugate[MchχT].Mchχ]];
 vecFCu = Conjugate[Inverse[Transpose[Eigenvectors[Mchχ.Conjugate[MchχT]]]]];
 vecFCv = Inverse[Transpose[Eigenvectors[Conjugate[MchχT].Mchχ]]];
 TCext = TC;
 $MinPrecision = 0;
 Im[{N[Sqrt[valSNe] * 10^-9, 4], N[Sqrt[valSNo] * 10^-9, 4]}] // Chop
]
```

Out[453]=
```
{{0, 0, 0, 0, 0, 0, 0}, {0, 0, 0, 0, 0, 0, 0}}
```

In[454]:=
```
Chop[N[vecSNe^2, 2], 0.01] // MatrixForm
```

Out[454]//MatrixForm=

$$\begin{pmatrix} 1.0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0.26 & 0.39 & 0.35 & 0 \\ 0 & 0 & 0 & 0.010 & 0.53 & 0.46 & 0 \\ 0 & 0 & 0 & 0.73 & 0.083 & 0.19 & 0 \\ 0 & 0 & 0.63 & 0 & 0 & 0 & 0.36 \\ 0 & 0.054 & 0.33 & 0 & 0 & 0 & 0.62 \\ 0 & 0.94 & 0.037 & 0 & 0 & 0 & 0.021 \end{pmatrix}$$

In[455]:=
```
N[Sqrt[valSNe] * 10^-9, 4] // Chop
```

Out[455]=
```
{6053., 2258., 1502., 1368., 717.5, 320.6, 23.07}
```

In[456]:=
```
Chop[N[vecSNo^2, 2], 0.01] // MatrixForm
```

Out[456]//MatrixForm=

$$\begin{pmatrix} 1.0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0.26 & 0.39 & 0.35 & 0 \\ 0 & 0 & 0.50 & 0 & 0 & 0 & 0.50 \\ 0 & 0 & 0 & 0.010 & 0.53 & 0.46 & 0 \\ 0 & 0 & 0 & 0.73 & 0.083 & 0.19 & 0 \\ 0 & 0 & 0.50 & 0 & 0 & 0 & 0.50 \\ 0 & 1.0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

In[457]:=
```
N[Sqrt[valSNo] * 10^-9, 4] // Chop
```

Out[457]=
```
{6053., 2258., 1732., 1502., 1368., 632.9, 0}
```

In[458]:= **Chop[N[vecSC^2, 2], 0.01] // MatrixForm**

Out[458]//MatrixForm=

$$\begin{pmatrix} 1.0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0.26 & 0.39 & 0.35 & 0 \\ 0 & 0 & 0.010 & 0.53 & 0.46 & 0 \\ 0 & 0 & 0.73 & 0.083 & 0.19 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1.0 \\ 0 & 1.0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

In[459]:= **N[Sqrt[valSC] * 10^-9, 4] // Chop**

Out[459]= {6053., 2259., 1504., 1371., 1001., 0}

In[460]:= **N[valFC * 10^-9, 4] // Chop**

Out[460]= {530.5, 376.2, 1.777, 0, 0}

In[461]:= **N[valFN * 10^-9, 4] // Chop**

Out[461]= $\left\{1055., 531.0, 408.0, 393.0, 331.7, 46.93, 1.726 \times 10^{-10}, 0, 0\right\}$