

```
Needs["MatrixPlot3D`"]
```

MatrixPlot3D examples

Instructions

```
In[34]:= ? MatrixPlot3D
```

MatrixPlot3D[matrix, displayoptions] provides 3D visualization of real matrices.

Example: MatrixPlot3D[{{0,1,0},{1,0,0},{0,0,1}}]

Compare with MatrixPlot

Basic usage examples

Error message: "input is not MatrixQ"

```
In[35]:= MatrixQ[x]
```

```
Out[35]= False
```

```
In[36]:= MatrixPlot3D[x]
```

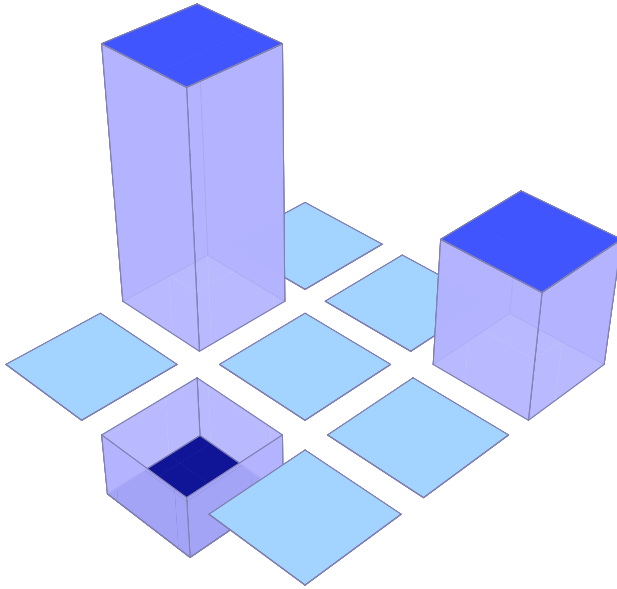
```
MatrixPlot3D::inappropriateinput : Input must be MatrixQ
```

```
Out[36]= $Aborted
```

Input is MatrixQ

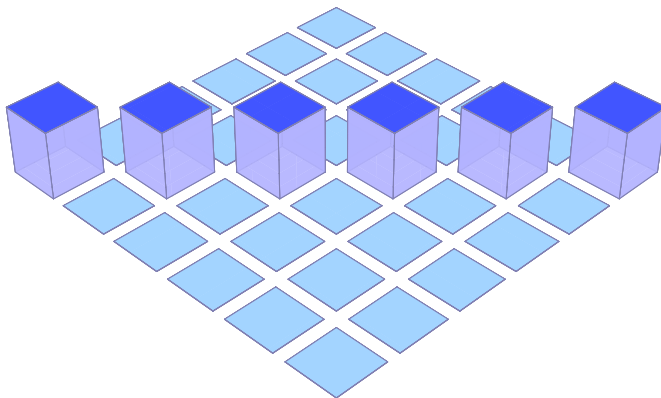
```
In[37]:= MatrixPlot3D[{{0, 2, 0}, {-0.5, 0, 0}, {0, 0, 1}}]
```

Out[37]=



```
In[38]:= MatrixPlot3D[IdentityMatrix[6]]
```

Out[38]=



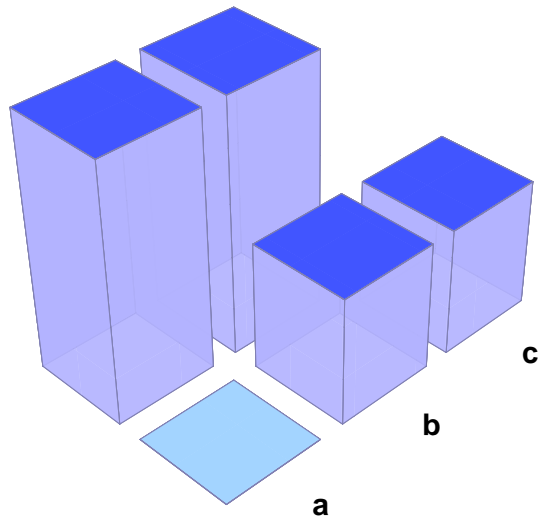
Display options

```
In[39]:= Options[MatrixPlot3D]
```

```
Out[39]= {RowLabels -> False, ColumnLabels -> False}
```

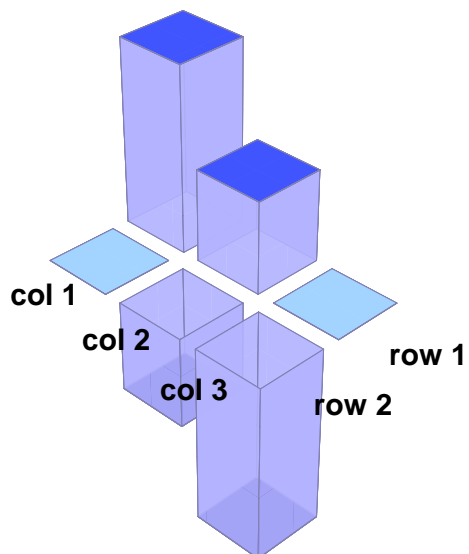
```
In[40]:= MatrixPlot3D[{{2, 2, 0}, {0, 1, 1}}, ColumnLabels -> {"a", "b", "c"}]
```

```
Out[40]=
```



```
In[41]:= MatrixPlot3D[{{2, 1, 0}, {0, -1, -2}},
  RowLabels -> {"row 1", "row 2"}, ColumnLabels -> {"col 1", "col 2", "col 3"},
  ViewPoint -> {2, 2, 2}, ViewVertical -> {0, 0, 2}]
```

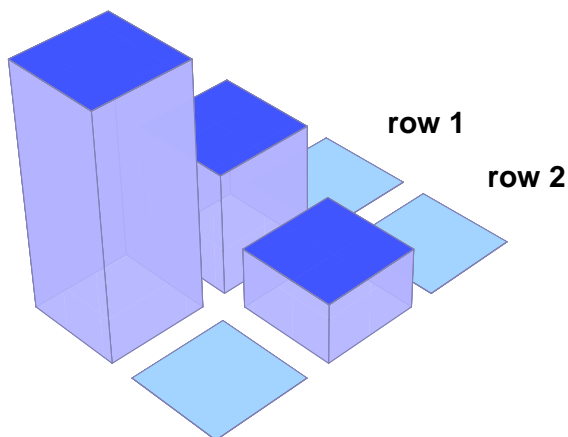
```
Out[41]=
```



Error message: labels have incompatible dimensions

```
In[42]:= MatrixPlot3D[{{2, 1, 0}, {0, 0.5, 0}}, RowLabels -> {"row 1", "row 2"}]
```

Out[42]=



```
In[43]:= MatrixPlot3D[{{2, 1, 0}, {0, 0.5, 0}}, RowLabels -> {"row 1", "row 2", "row 3"}]
```

MatrixPlot3D::mismatcheddimensions : Basis labels incompatible with the matrix dimensions

Out[43]= \$Aborted

Spin dynamics examples

3D matrix representation of operators

```
In[52]:= Needs["NMR`SpinOperators`"]
```

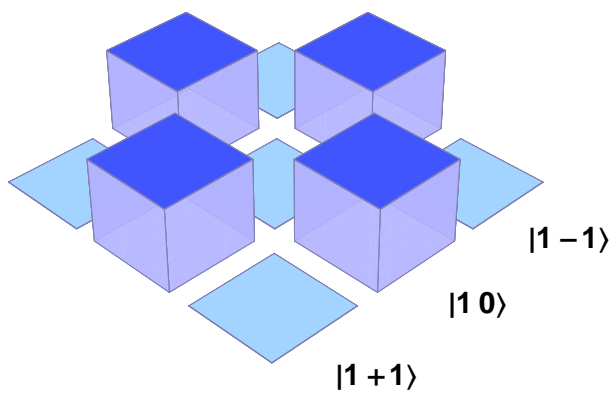
```
In[53]:= SetSpinSystem[{{1, 1}}]
```

```
MatrixPlot3D[
  MatrixRepresentation[opI["x"]],
  ColumnLabels → BasisKets[],
  ImageSize → 300
]
```

SetSpinSystem::set : the spin system has been set to $\{\{1, 1\}\}$

SetBasis::set : the state basis has been set to ZeemanBasis[$\{\{1, 1\}\}$, BasisLabels → Automatic].

```
Out[54]=
```

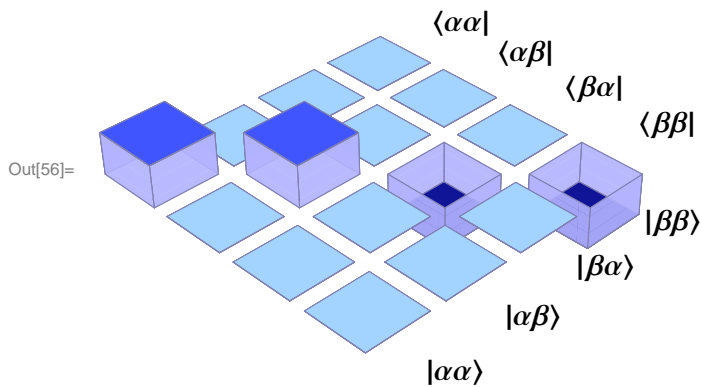


```
In[55]:= SetSpinSystem[2]
```

```
MatrixPlot3D[
  MatrixRepresentation[opI[1, "z"]],
  RowLabels -> BasisBras[],
  ColumnLabels -> BasisKets[]
]
```

SetSpinSystem::set : the spin system has been set to $\left\{\left\{1, \frac{1}{2}\right\}, \left\{2, \frac{1}{2}\right\}\right\}$

SetBasis::set : the state basis has been set to ZeemanBasis $\left[\left\{\left\{1, \frac{1}{2}\right\}, \left\{2, \frac{1}{2}\right\}\right\}, \text{BasisLabels} \rightarrow \text{Automatic}\right]$.



High quality export

```
In[57]:= SetSpinSystem[2]
```

SetSpinSystem::set : the spin system has been set to $\left\{\left\{1, \frac{1}{2}\right\}, \left\{2, \frac{1}{2}\right\}\right\}$

```

In[58]:= Rasterize[

  MatrixPlot3D[
    MatrixRepresentation[(opI[1, "z"] - opI[2, "z"])
  ],
  RowLabels → BasisBras[], ColumnLabels → BasisKets[], ImageSize → 400
  ],
  ImageResolution → 200]

```

