

```
1      2      3

16     16    0.000000 0.000000

===== PiLib Variable =====
hop.onsite_E, @t-sp, onsite energy matrix
ORDER=  1, SIZE=[ 13,  3], TYPE=SPARSE
```

```
1      2      3

16     16    0.000000 0.000000
1      1   -0.300000 0.000000
2      2   -0.300000 0.000000
3      3   -0.300000 0.000000
6      6   -0.300000 0.000000
7      7   -0.300000 0.000000
8      8   -0.300000 0.000000
11     11   -0.300000 0.000000
12     12   -0.300000 0.000000
13     13   -0.300000 0.000000
14     14   -0.300000 0.000000
15     15   -0.300000 0.000000
16     16   -0.300000 0.000000
```

```
===== PiLib Variable =====
hop.hop_size, @full, size of hop.hop_mat, [sublatt, size(hop.hop_mat(n))]
ORDER=  0, SIZE=[  2,  4], TYPE=INTEGER
```

```
1      2      3      4

1     16     16      6
2     16     16      6
```

```
===== PiLib Variable =====
hop.hop_mat(1)(:,:,1), @a-sp, hop_mat between site-1 and its 1-th neighbor
ORDER=  1, SIZE=[  7,  3], TYPE=SPARSE
```

```
1      2      3

16     16    0.000000 0.000000
3      13    0.100000 0.000000
4      11    0.173205 0.000000
5      11   -0.100000 0.000000
8      16    0.100000 0.000000
9      14    0.173205 0.000000
10     14   -0.100000 0.000000
```

```
===== PiLib Variable =====
hop.hop_mat(1)(:,:,2), @a-sp, hop_mat between site-1 and its 2-th neighbor
ORDER=  1, SIZE=[  9,  3], TYPE=SPARSE
```

```
1      2      3

16     16    0.000000 0.000000
1      11    0.100000 0.000000
2      13    0.100000 0.000000
```