

Bed[K\_, ω\_] :=

Module[{t, r, XingsByArmpits, bends, faces, p, A, is},

t = 1 - ω; r = t + t\*;

XingsByArmpits =

List@@PD[K] /. x : X[i\_, j\_, k\_, L\_] =>

If[PositiveQ[x], X+[-i, j, k, -L], X-[-j, k, L, -i]];

bends = Times@@XingsByArmpits /.

\_ [X][a\_, b\_, c\_, d\_] => p<sub>a,-d</sub> p<sub>b,-a</sub> p<sub>c,-b</sub> p<sub>d,-c</sub>;

faces = bends //. p<sub>x\_,y\_</sub> p<sub>y\_,z\_</sub> => p<sub>x,y,z</sub>;

A = Table[0, Length@faces, Length@faces];

Do[is = Position[faces, #][[1, 1]] & /@ List@@x;

A[[is, is]] += If[Head[x] === X+,

$$\begin{pmatrix} -r & -t & 2t & t^* \\ -t^* & 0 & t^* & 0 \\ 2t^* & t & -r & -t^* \\ t & 0 & -t & 0 \end{pmatrix}, \begin{pmatrix} r & -t & -2t^* & t^* \\ -t^* & 0 & t^* & 0 \\ -2t & t & r & -t^* \\ t & 0 & -t & 0 \end{pmatrix},$$

{x, XingsByArmpits}];

MatrixSignature[A];