1 Case 33

The minimal zero supports are given by (1,2,3),(1,2,4),(1,3,5),(2,4,5),(3,5,6),(4,5,6).

$$A = \begin{pmatrix} 1 & -cos(\phi_2) & -cos(\phi_1) & cos(\phi_2+\phi_3) & cos(\phi_1+\phi_4) & b_1 \\ -cos(\phi_2) & 1 & cos(\phi_1+\phi_2) & -cos(\phi_3) & cos(\phi_3+\phi_5) & b_2 \\ -cos(\phi_1) & cos(\phi_1+\phi_2) & 1 & b_3 & -cos(\phi_4) & cos(\phi_4+\phi_6) \\ cos(\phi_2+\phi_3) & -cos(\phi_3) & b_3 & 1 & -cos(\phi_5) & cos(\phi_5+\phi_6) \\ cos(\phi_1+\phi_4) & cos(\phi_3+\phi_5) & -cos(\phi_4) & -cos(\phi_5) & 1 & -cos(\phi_6) \\ b_1 & b_2 & cos(\phi_4+\phi_6) & cos(\phi_5+\phi_6) & -cos(\phi_6) & 1 \end{pmatrix}$$

The zeros are given by the columns:

$$(u_1,u_2,u_3,u_4,u_5,u_6) = \begin{pmatrix} sin(\phi_1+\phi_2) \\ sin(\phi_1) \\ sin(\phi_2) \\ 0 \\ 0 \\ 0 \end{pmatrix} \begin{pmatrix} sin(\phi_3) \\ sin(\phi_2+\phi_3) \\ 0 \\ sin(\phi_2) \\ 0 \\ 0 \end{pmatrix} \begin{pmatrix} sin(\phi_4) \\ 0 \\ sin(\phi_1+\phi_4) \\ 0 \\ sin(\phi_1) \\ 0 \end{pmatrix} \begin{pmatrix} 0 \\ sin(\phi_5) \\ 0 \\ sin(\phi_3+\phi_5) \\ sin(\phi_3) \\ 0 \end{pmatrix} \begin{pmatrix} 0 \\ 0 \\ sin(\phi_6) \\ 0 \\ sin(\phi_4+\phi_6) \\ sin(\phi_4) \end{pmatrix} \begin{pmatrix} 0 \\ 0 \\ 0 \\ sin(\phi_6) \\ sin(\phi_5+\phi_6) \\ sin(\phi_5) \end{pmatrix}$$

The zeros in this case are dependent. $a*u_1+b*u_2+c*u_3+d*u_4+e*u_5+f*u_6=0$

$a = \frac{sin(\phi_1-\phi_3+\phi_4-\phi_5)sin(\phi_1-\phi_2-\phi_3+\phi_4-\phi_5)}{sin(\phi_1)}$

$b = \frac{sin(\phi_1-\phi_3+\phi_4-\phi_5)(sin(\phi_2)-sin(\phi_1-\phi_3+\phi_4-\phi_5))}{sin(\phi_3)}$

$c = \frac{sin(\phi_3-\phi_4+\phi_5)}{sin(\phi_4)}(\frac{sin(\phi_2)(sin(\phi_2)-sin(\phi_1-\phi_3+\phi_4-\phi_5))}{sin(\phi_3-\phi_4+\phi_5)}+\frac{sin(\phi_1-\phi_2-\phi_3+\phi_4-\phi_5)sin(\phi_2)}{sin(\phi_1)})$

$d = -\frac{sin(\phi_5-\phi_4)}{sin(\phi_5)}(\frac{sin(\phi_1)sin(\phi_2)}{sin(\phi_5-\phi_4)}(\frac{(sin(\phi_2)-sin(\phi_1-\phi_3+\phi_4-\phi_5))}{sin(\phi_3-\phi_4+\phi_5)}+\frac{sin(\phi_1-\phi_2-\phi_3+\phi_4-\phi_5)}{sin(\phi_1)})+\frac{sin(\phi_2)(sin(\phi_2)-sin(\phi_1-\phi_3+\phi_4-\phi_5))sin(\phi_1-\phi_3+\phi_4-\phi_5)}{sin(\phi_3-\phi_4+\phi_5)sin(\phi_3)})$

$T = \frac{sin(\phi_3)}{sin(\phi_5)}(\frac{sin(\phi_1)sin(\phi_2)}{sin(\phi_5-\phi_4)}(\frac{(sin(\phi_2)-sin(\phi_1-\phi_3+\phi_4-\phi_5))}{sin(\phi_3-\phi_4+\phi_5)}+\frac{sin(\phi_1-\phi_2-\phi_3+\phi_4-\phi_5)}{sin(\phi_1)})+\frac{sin(\phi_2)(sin(\phi_2)-sin(\phi_1-\phi_3+\phi_4-\phi_5))sin(\phi_1-\phi_3+\phi_4-\phi_5)}{sin(\phi_3-\phi_4+\phi_5)sin(\phi_3)})$
$-\frac{sin(\phi_1)sin(\phi_3-\phi_4+\phi_5)}{sin(\phi_5-\phi_4)sin(\phi_4)}(\frac{sin(\phi_2)(sin(\phi_2)-sin(\phi_1-\phi_3+\phi_4-\phi_5))sin(\phi_1-\phi_2-\phi_3+\phi_4-\phi_5)}{sin(\phi_3-\phi_4+\phi_5)}+\frac{sin(\phi_2)sin(\phi_1-\phi_2-\phi_3+\phi_4-\phi_5)}{sin(\phi_1)})$

$e = \frac{sin(\phi_5)}{sin(\phi_6)}T$

$f = -\frac{sin(\phi_4)}{sin(\phi_6)}T$