

Wave direction check

$$Q = \begin{pmatrix} a + b(g_x^2 - 1) & bg_x g_y \\ bg_x g_y & a + b(g_y^2 - 1) \end{pmatrix}$$

$$Q = \begin{pmatrix} a + b(\cos^2 x - 1) & b \cos x \sin x \\ b \cos x \sin x & a + b(\sin^2 x - 1) \end{pmatrix}$$

$$Q = \begin{pmatrix} a - b(\sin^2 x) & b \cos x \sin x \\ b \cos x \sin x & a - b(\cos^2 x) \end{pmatrix}$$

$$P = \begin{pmatrix} a - b(\sin^2 x) & b \cos x \sin x & a - b(\sin^2 y) & b \cos y \sin y \\ b \cos x \sin x & a - b(\cos^2 x) & b \cos y \sin y & a - b(\cos^2 y) \\ a - b(\sin^2 x) & b \cos x \sin x & a - b(\sin^2 y) & b \cos y \sin y \\ b \cos x \sin x & a - b(\cos^2 x) & b \cos y \sin y & a - b(\cos^2 y) \end{pmatrix}$$

$$d = \begin{pmatrix} \cos x \\ \sin x \\ \cos y \\ \sin y \end{pmatrix} = \begin{pmatrix} d_{1x} \\ d_{1y} \\ d_{2x} \\ d_{2y} \end{pmatrix}$$

$$Pd = a \begin{pmatrix} \cos x + \cos y \\ \sin x + \sin y \\ \cos x + \cos y \\ \sin x + \sin y \end{pmatrix}$$

d is not an eigenvector of P , and because of the repeat rows, any eigenvector d will have repeat values