BE 2D growth rate

$$\left(G^{n+1} \cdot e^{ikp\Delta x} \cdot e^{ikq\Delta x} - G^{n} \cdot e^{ikp\Delta x} \cdot e^{ikq\Delta x}\right)/\Delta t$$

$$= \frac{\alpha}{\Delta x^2} G^{n+1}\Big(e^{ik(p-1)\Delta x} \cdot e^{ikq\Delta x} + e^{ik(p+1)\Delta x} \cdot e^{ikq\Delta x} +$$

$$e^{ikp\Delta x} \cdot e^{ik(q-1)\Delta x} + e^{ikp\Delta x} \cdot e^{ik(q+1)\Delta x} +$$

$$- 4 \cdot e^{ikp\Delta x} \cdot e^{ikq\Delta x}\Big)$$

$$G^{n+1} - G^{n} = \frac{\alpha \Delta t}{\Delta x^2} G^{n+1}\Big(e^{-ik\Delta x} + e^{ik\Delta x} +$$

$$e^{-ik\Delta x} + e^{ik\Delta x} +$$

$$-4\Big)$$

$$G^{n+1}\left(1 - C\left(4\cos(k\Delta x) - 4\right)\right) = G^{n}$$

$$\frac{G^{n+1}}{G^{n}} = \frac{1}{1 - 4C(\cos(k\Delta x) - 1)}$$, but $\cos(k\Delta x)$ goes from -1 to 1,

so rate is from $\boxed{\frac{1}{1+8C}}$ to 1, unconditionally stable.