

Letter to referee FRACTALS -D-12-00044,
All suggestions are welcome and have been incorporated:

comment 1

Typos in equation (3.2) and the one on the line below have been corrected. The equation now is:

“On the other hand, distributivity of the product over addition does not hold. Consider the second iteration in terms of the initial value

$$\overset{o}{\varphi}_3 = \overset{o}{\varphi}_2^2 + \overset{o}{c} = \left(\overset{o}{\varphi}_1^2 + \overset{o}{c} \right)^2 + \overset{o}{c} = \left(\overset{o}{\varphi}_1^2 + \overset{o}{c} \right) \left(\overset{o}{\varphi}_1^2 + \overset{o}{c} \right) + \overset{o}{c}.$$

This scator is not equal to $\overset{o'}{\varphi}_3 = \overset{o}{\varphi}_1^4 + 2\overset{o}{c}\overset{o}{\varphi}_1^2 + \overset{o}{c}^2 + \overset{o}{c}$. “

comment 2

The symmetries have been explicitly written as suggested by the referee. Two sentences were added:

“These symmetries can be extended by induction to the nth iteration. The symmetries under inversion of the director axes are

$$s_n(s; x, y) = s_n(s; -x, y) = s_n(s; x, -y),$$

$$x_n(s; -x, y) = -x_n(s; x, y), \quad x_n(s; x, -y) = x_n(s; x, y),$$

$$y_n(s; x, -y) = -y_n(s; x, y), \quad y_n(s; -x, y) = y_n(s; x, y).$$

Symmetries under the director axes exchange are

$$s_n(s; x, y) = s_n(s; y, x), \quad x_n(s; x, y) = y_n(s; y, x), \quad y_n(s; x, y) = x_n(s; y, x).$$

There is therefore also symmetry with respect to the 45° planes in the director axes.”

comment 3

The following paragraph was added to the conclusions to include the comparison with the logistic map as suggested by the referee.

“Recall that the logistic map exhibits a one to one correspondence with the M-set on the real axis. The Mandelbrot period doubling points coincide with the bifurcation points of the Verhulst process. The $\mathbf{c2i0E}^{1+2}$ set exhibits this same one to one correspondence with the bifurcation diagram of the logistic map. As we have shown, it suffices to lift the second hypercomplex axis by 10^{-20} to reveal this structure”