Problem page 100 : "*The Theory of the Moire Phenomenon*" Volume II, by I. Amidror, published by Springer,

3-18 *Synthesis of a layer superposition having a predefined fixed locus.*

"Design layer transformations $\mathbf{g}_1(x, y)$ *and* $\mathbf{g}_2(x, y)$ *that will produce in the superposition of two initially identical random screens a fixed locus consisting of a star-like curve that surrounds the origin as shown in the figure on the front cover of this book. Hint: In this case, you may consider a top-opened conic surface having star-like level lines, such as* $z = r(1 + 0.5\cos 5\theta)$*, or, possibly,* $z = r/(1 + 0.5\cos 5\theta)$*, which gives a slightly different star. You may adjust the orientation of the star by replacing* cos *by* sin *or by* $-$sin*, as seems suitable. In order to have this surface intersect the* x, y *plane along a star, you need to lower it by some constant* z_0*:* $z = r(1 + 0.5\cos 5\theta) - z_0$*. But if you wish to obtain a more complex surface that intersects the* x, y *plane on a family of concentric stars, you may consider a surface such as:* $z = \sin(r(1 + 0.5\cos 5\theta))$*."*