Application of the Ahlfors 5 Island Theorem in complex dimension 2

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The function $f(z) = z^k$ has the following property on the unit circle: The distance $d(f(p), f(q)) = kd(p, q)$ so is multiplied by $k$ for nearby points $p, q$. We say that $f$ has entropy $\log k$. In general a polynomial $f(z)$ of degree $k$ has entropy $\log k$. Going to two dimensions, Smillie proved in 1990 that the Henon map $F(z, w) = (f(z) + w, z)$ has entropy $\log k$ if $f(z)$ is a polynomial of degree $k$. It is natural to think then that if $f(z)$ is an entire transcendental function, then the entropy of $F$ should be infinite. Indeed this is the case. The key tool is the Ahlfors 5 Island Theorem. This is work in progress together with Leandro Arosio, Anna Miriam Benini and Han Peters.