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A NATURAL INVARIANT MEASURE FOR POLYNOMIAL SEMIGROUPS, AND ITS PROPERTIES

In this talk, we give a description of a natural invariant measure associated with a finitely generated polynomial semigroup (which we shall call the Dinh–Sibony measure) in terms of potential theory. The existence of this measure follows from a very general result of Dinh–Sibony applied to a holomorphic correspondence in $\mathbb{P}^1 \times \mathbb{P}^1$ that one can associate naturally with a semigroup of the above type. We obtain a complete description of this invariant measure. This requires the theory of logarithmic potentials in the presence of an external field, which, in our case, is explicitly determined by the choice of a set of generators. Our result generalizes the classical result of Brolin. Along the way, we establish the continuity of the logarithmic potential for the Dinh–Sibony measure, which might be of independent interest. If time permits, we shall also present some bounds on the capacity and diameter of the Julia sets of such semigroups, which uses the F-functional of Mhaskar and Saff.