

# Superharmonicity and harmonicity properties of condenser energy under dilation

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## Abstract

Consider a domain  $D$  in  $\mathbb{C}$  and a compact subset  $K$  of  $D$  such that  $D \setminus K$  is connected. If  $z \in \mathbb{C}$ , the dilation of  $D$  is the set  $zD = \{zw : w \in D\}$ . If  $E(z)$  is the energy of the condenser with plates  $K$  and  $\mathbb{C} \setminus zD$ , for all  $z$  such that  $K \subset zD$ , then  $E$  is superharmonic.  $E$  is harmonic if and only if  $\text{Int}(K)$ ,  $D$  are approximately concentric disks. If  $R$  is another domain which contains  $K$  we consider the case where the Green equilibrium measures of  $K$  with respect to  $D$  and  $R$  are the same.