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$\mathcal{P}$-Measure in the Class of $m-wsh$ Functions

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In this work we study the $\mathcal{P}$-measure and $\mathcal{P}$-capacity in the class of $m-wsh$ functions and prove a number of their properties.

Keywords: $m-wsh$ function, $\mathcal{P}$-measure, $\mathcal{P}$-capacity, mw-regular point.

Introduction

The classical potential theory (see [1, 2]) works with classes of harmonic and subharmonic functions and involves such concepts like the condenser capacity, harmonic measures of the sets, polar sets and others. The pluripotential theory, as is known, deals with the class of *psh* functions and the Monge-Ampere operator $(dd^c u)^n = 0$ (see [3, 4]), where as usual

$$d = \partial + \overline{\partial}, d^c = \frac{\partial - \overline{\partial}}{4i}.$$

In the recent work [5] the author has studied the class of $m - wsh$ functions, introduced the concept of mw-polarity of sets and proved several of their properties. In this paper we study the $\mathcal{P}$-measure and $\mathcal{P}$-capacity in the class of $m-wsh$ functions. In section 1 we briefly give the definition of $m-wsh$ functions and some results, which we use below. In section 2 we give the definition of $\mathcal{P}$-measure and we prove some of its properties. Section 3 is dedicated to the $\mathcal{P}$-capacity and its properties.

We note that $m-sh$ and $m-wsh$ functions are related to the Hessians of function u (see [3, 6]). They can be used in different problems of multidimentional complex analysis. One of such application is shown in the work [6] (see also [7, 8]) where the characteristic functions of Nevalinna of higher order are estimated.

1. m−wsh functions

Definition 1. *A function $u(z) \in L^1_{loc}(D)$ given in a domain $D \subset \mathbb{C}^n$ is called an $m - wsh$ function (subharmonic function on $(n-m+1)$-dimensional complex surfaces) in D, $1 \leqslant m \leqslant n$, if:*

1) it is upper semicontinuous in D, i.e.

$$\overline{\lim_{z\to z^0}}\, u(z) = \lim_{\varepsilon\to 0} \sup_{B(z^0,\varepsilon)} u(z) \leqslant u(z^0);$$

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