Remarks on the differentials of multifunction and the differentials of regular multidistributions

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AMS (1991) subject classification: $46B20$, $46E99$, $46F99$, $28B20$, $47B99$, $47H77$.

Key words and phrases: Musielak-Orlicz space of multifunctions, linear functional, dual space, distribution, Schwartz space, De Blasi differential of multifunction.

ABSTRACT.
The notion of multidistribution, X-distribution and regular multidistribution were introduced in my paper "On multidistributions and X-distributions". This paper was presented on Function Spaces V (see Proccedings of the Conference). The aim of my talk is to present some new aspects of differentiability of regular multidistributions. We introduce the notions of an a.-multidistribution, differential of multifunction, regular multidistribution and the notion of differential of regular multidistibution. We give some theorems.

The main result:

Let $f \in C^1(R)$ and $f(t) \geq 0$ for every $t \in R$. Let

$$\tilde{M}_f(F) = conv(\{\int_R f(t)\underline{f}(F)(t)dt\}, \{\int_R f(t)\overline{f}(F)(t)dt\}).$$

We have

$$(\int_R f(t)\underline{f}'(F)(t)dt, \int_R f(t)\overline{f}'(F)(t)dt)$$

$$= (-\int_R f'(t)\underline{f}(F)(t)dt, -\int_R f'(t)\overline{f}(F)(t)dt).$$

So we can define the differential of a multidistribution $\tilde{M}_f$ as follows:

$$(\tilde{M}_f(F))' = -\tilde{M}_{f'}(F)$$

for every $F \in X_{m,\mathcal{D}}$.

Theorem 1 *Let $f \in C^1(R)$ and $f(t), f'(t) \geq 0$ for every $t \in R$, then the mapping $(\tilde{M}_f)'$ is a multidistribution.*