

Quasiconvex families of functions and quasimonotone families of operators

N. Hadjisavvas (with F. Flores-Bazán and Y. García) *

Abstract

It is well-known that the sum of two quasiconvex functions is not necessarily quasiconvex. Likewise, the sum of two quasimonotone operators is not quasimonotone in general. We introduce the notions of quasiconvex family of functions, and quasimonotone family of operators. Such families are shown to be stable by addition. We give characterizations of a family of functions to be quasiconvex, and the relation to quasimonotonicity of the family of their subdifferentials. We examine when other properties, such as strict or semistrict quasimonotonicity, are also preserved by addition.

Some particular attention is given to properly quasimonotone operators, because of their importance. We especially describe the case when a quasimonotone operator is not properly quasimonotone.

*University of the Aegean, Greece nhad@aegean.gr