

# RATIONAL REPRESENTATION OF REAL FUNCTIONS

WOJCIECH KUCHARZ, UNIVERSITÉ JAGELLONNE (CRACOVIE)

Let  $X$  be an irreducible smooth real algebraic variety of dimension at least 2 and let  $f: U \rightarrow \mathbb{R}$  be a function defined on a connected open subset  $U \subset \mathbb{R}^n$ . Assume that for every irreducible smooth real algebraic curve  $C \subset X$ , for which  $C(\mathbb{R})$  is the boundary of a disc embedded in  $U$ , the restriction  $f|_{C(\mathbb{R})}$  is continuous and has a rational representation. Then  $f$  has a rational representation. This is a significant refinement of a recent result of J. Kollár and the authors. The novelty is that existence of rational representation is tested on a much smaller and more rigid class of curves. We also consider the case where  $U$  is not necessarily connected and test rationality on subvarieties of dimension greater than 1. For semialgebraic functions our results hold under slightly weaker assumptions. Joint work with K. Kurdyka