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POROSITY, \mathfrak{A} -DENSITY TOPOLOGY AND ABSTRACT DENSITY TOPOLOGIES

Introduction.

The present article contains proofs of some results presented in my lecture on Scuola di Analisi Reale, Ravello 1985.

W. Wilczyński [13] defined the \mathfrak{A} -density topology on R which is in a sense a category analogue of the density topology on R . The properties of the \mathfrak{A} -density topology and its generalization to R^n were investigated in several articles (cf. [14]).

The \mathfrak{A} -density topology was defined by W. Wilczyński as a topology determined by a special "lower density in the category sense". Topologies which are determined by an arbitrary "lower density in the category sense" (abstract category density topologies) are investigated in [6] simultaneously with the usual abstract density topologies (defined on measure spaces, cf. [12]) from an abstract point of view. In the first part of the article we state some basic results on abstract density topologies from [6] and describe a general, simple construction of abstract category density topologies. For example, to the a.e.-topology and r -topology (defined by R. J. O'Malley in [7]) there corresponds by this construction abstract category density topologies a^* and r^* .

The original definition of the \mathfrak{A} -density topology uses the algebraic structure of R but it is possible to give a definition using topological notions and the notion of porosity only. This enables us to define in the second part of the article a generalization of the \mathfrak{A} -density topology in an arbitrary metric space (p^* -topology). We prove several theorems concerning the p^* -topology. In particular, we answer a question from [1] which concerns the \mathfrak{A} -density topology.

Since there exist several variants of the notion of porosity, we obtain definitions of new abstract category density topologies which are very similar to the \mathfrak{A} -density topology. The definitions of these topologies and a