Eva Butkovičová Short branches in Rudin-Frolík order

Commentationes Mathematicae Universitatis Carolinae, Vol. 25 (1984), No. 2, 365

Persistent URL: http://dml.cz/dmlcz/106310

## Terms of use:

© Charles University in Prague, Faculty of Mathematics and Physics, 1984

Institute of Mathematics of the Academy of Sciences of the Czech Republic provides access to digitized documents strictly for personal use. Each copy of any part of this document must contain these *Terms of use*.



This paper has been digitized, optimized for electronic delivery and stamped with digital signature within the project *DML-CZ: The Czech Digital Mathematics Library* http://project.dml.cz

- A. Szymański: Some applications of tiny se-[8] quences, to appear. M. Talagrand: Non existence de relèvement
- [#1 pour certaines mesures finiement additives et retractés de SN , Math, Ann. 256(1981), 63-66.

## SHORT BRANCHES IN RUDIN-FROLIK ORDER

Eva Butkovičová (MÚ SAV. Jesenná 5. 04154 Košice.Českoslevenske). oblatum 27.4. 1984.

Rudin-Frolik order of types of ultrafilters in AN has the following properties: (1) each type of ultrafilters has at most 2<sup>50</sup> predecessors,

[2], (2) the cardinality of each branch is at least  $2^{50}$ . Thus, in Rudin-Frolik order the cardinality of branches can be only  $2^{50}$  or  $(2^{50})^+$ . It was shown in [1] that there exists a chain order - isomorphic to  $(2^{50})^+$ . Hence, the existence of a branch of cardinality  $(2^{50})^+$  is proved. The following result solves the problem of the existence of a branch having smaller cardinality.

Theorem. In Rudin-Frolik order there exists an unbounded chain order-isomorphic to  $\omega_1$ .

By the properties (1) and (2) the branch containing this chain has cardinality  $2^{r_0}$ .

- E. Butkovičová: Long chains in Rudin-Frolík or-der, Comment. Math. Univ. Carolinae 24(1983), 563-570. References: [1]
  - [2] Z. Frolik: Sums of ultrafilters, Bull. Amer. Math. Soc. 73(1967), 87-91.

## RESULTS ON DISJOINT COVERING SYSTEMS ON THE RING OF INTEGERS

Ivan Korec, Department of Algebra, Faculty of Mathematics and Physics of Comenius University, 84215 Bratislava, Czechoslovakia oblatum 12.4. 1984.

A system of congruence classes a<sub>1</sub>(mod n<sub>1</sub>), a<sub>2</sub>(mod n<sub>2</sub>), ..., a<sub>k</sub>(mod n<sub>k</sub>) (1) will be called a disjoint covering system (DCS) if for every integer x there is exactly one  $i \in \{1, 2, ..., k\}$  such that  $x \equiv a_1 \pmod{n_1}$ . The integers  $n_1, n_2, ..., n_k$  will be called moduli of (1) and their least common multiple will be called the common modulus of (1).

If  $k \ge 1$  then no two moduli of (1) are relatively prime. This condition can be expressed in the form k

(2)  $\begin{array}{c} x & x \\ i=1 & j=1 \end{array} \\ \psi(n_i, n_j) \\ \psi \text{ here } \varphi(x, y) \text{ is the formula} \\ \exists z \exists u \exists v (z \neq 1 \land z.u = x \land z.v = y) \\ \text{Consider more generally the formulae of the form} \end{array}$ 

- 365 -