Eva Butkovičová Short branches in Rudin-Frolík order

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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 2⁵⁰ 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 ω_1 .

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

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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 a₁(mod n₁), a₂(mod n₂), ..., a_k(mod n_k) (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) $\begin{array}{c} x & x \\ i=1 & j=1 \end{array} \\ \psi(n_i, n_j) \\ \psi \text{ here } \varphi(x, y) \text{ is the formula} \\ \exists z \exists u \exists v (z \neq 1 \land z.u = x \land z.v = y) \\ \text{Consider more generally the formulae of the form} \end{array}$

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