Eva Zmeškalová

Shortening of the universal class in the alternative set theory [Abstract of thesis]

vector bundles arising in differential geometry of the second order are int-
roduced axiomatically, and their basic properties are deduced. Further, an
algebraic definition of a double linear connection is formulated and an e-
quivalent characterization via flows and lifting of vector fields is given.
Finally, special connections on soldered double vector spaces are investi-
gated and a new way of finding all natural transformations of the second tan-
gent functor TT into itself and the functor TT* into itself is established.

SHORTENING OF THE UNIVERSAL CLASS IN THE ALTERNATIVE SET THEORY

E. ZMEŠKALOVÁ, Department of Mathematics and Physics, Pedagogical Faculty,
Jeronýmova 10, 37115 České Budějovice, Czechoslovakia
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In the present thesis, problems of shortening the universal class in
the alternative set theory are investigated.
The result of the first part is the confirmation P. Vopěnka´s hypothesis
on the possibility to interpret the alternative set theory in a theory, in
the axiomatic system of which there is no scheme of induction axioms and sa-
tisfying the condition that in those of its axioms which need the existence
of sets (except some variant of the axiom of prolongation), this existence
has an operational character.
New facts are presented in the second part, obtained by means of using
the procedures which led to the shortening of the universal class in the
first part of the work.
Here we have formulated and proved a theorem on existence of π-univer-
sa of specific properties and its consequence, namely a dualization of the
Levenheim-Skolem guaranteeing the existence of π-model for an arbitrary
first order theory having a countable model.(Under π-model we understand
a model with the following properties: First, the universum of the model is
the intersection of a countable class of sets, and secondly, any relation
and any function of this model appear to be an intersection of its universe
with some set.)
The use of the method of shortening of the universal class in the area
of the Δ_0-endomorphism (a generalization of an endomorphism) leads to a con-
struction of a model of Peano axiom system. The second part of the thesis ends
by its description.

THE SOLUTION OF SOME MAX-SEPARABLE OPTIMIZATION PROBLEMS

Amer F. JAJOU, Iraq
(8.10. 1876, supervisor K. Zimmermann)

Max- (min) separable optimization problems have found a considerable in-
terest in the literature, both theoretically and practically; such problems
have been studied extensively, e.g. by Butkovič and Hevery, Cunninghame-Green,
and Zimmermann.
The aim of this work is to derive some threshold type algorithms to sol-
ve some special cases of certain max-separable optimization problem of general
form

(1) $f(X) = \max\limits_{j \in n} f_j(x_j) \longrightarrow \min (\max); \max\limits_{j \in m} r_{ij}(x_j):b_i, \ i \in s; \ k_j \leq x_j \leq K_j, \ j \in n$

where: stands for any of the relations $=, \leq, \geq$. f_j, r_{ij} are continuous func-
tions on $[k_j, K_j], k_j, K_j$, b_i are given real numbers.
We state some geometrical properties of the set of all feasible solutions