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ANNOUNCEMENTS OF NEW RESULTS

MAL'CEV CONDITIONS FOR CONGRUENCE-REGULAR AND CONGRUENCE-
PERMUTABLE VARIETIES

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Notions. For any algebra $\mathcal{U} = \langle A, F \rangle$, an element $a \in A$ and a relation R on A , the subset $\{x \in A; (a, x) \in R\}$ is called a class of R . \mathcal{U} is called congruence-regular, tolerance regular, reflexive and compatible-regular if any two congruences, tolerances, reflexive and compatible relations on \mathcal{U} , respectively, coincide whenever they have a class in common.

Remark. Recently, I. Chajda has given Mal'cev conditions for varieties of (i) congruence-regular and congruence-permutable algebras (see [1]); (ii) tolerance-regular algebras (see [2]).

We state that these two classes of varieties coincide and some other Mal'cev conditions hold.

Theorem. For any variety V the following conditions are equivalent:

- (1) V is congruence-regular and congruence-permutable;
- (2) V is tolerance-regular;
- (3) V is reflexive and compatible-regular;
- (4) There exist a $(2n+3)$ -ary polynomial t and ternary polynomials p_i ($i=1, \dots, n$) such that $x=t(x, y, z, z, \dots, z, p_1(x, y, z), \dots, p_n(x, y, z))$ $y=t(x, y, z, p_1(x, y, z), \dots, p_n(x, y, z), z, \dots, z)$ $z=p_1(x, x, z)=\dots=p_n(x, x, z)$;
- (5) There exist a $(n+3)$ -ary polynomial r and ternary polynomials p_i ($i=1, \dots, n$) such that $x=r(x, y, z, z, \dots, z, p_1(x, y, z), \dots, p_n(x, y, z))$ $y=r(x, y, z, p_1(x, y, z), \dots, p_n(x, y, z))$ $z=p_1(x, x, z)=\dots=p_n(x, x, z)$.

References. [1] I. Chajda, Regularity and permutability of congruences, to appear in Algebra Univ. 9(1979).
[2] I. Chajda, A Mal'cev characterization of tolerance regularity, to appear in Acta Sci. Math.(Szeged).

ISOMORPHISM OF PRODUCTS OF WEAKLY HOMOGENEOUS SPACES

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There exists a metric space X with the following properties:

- (1) for every $x, y \in X$ there are open neighbourhoods U, V , $x \in U, y \in V$, and a homeomorphism h of U onto V such that $h(x) = y$ (i.e. X is weakly homogeneous),
- (ii) X is isometric to X^3 ,
- (iii) X is not homeomorphic to X^2 .

This result (as a special case of a representation theorem) will appear in this journal under the title "Representations of countable commutative semigroups by products of weakly homogeneous spaces".