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VARIETIES OF SUBREGULAR ALGEBRAS ARE DEFINABLE BY A MAL'CEV CONDITION

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In [1], J. Timm introduced the concept of subregular algebra as follows: An algebra $\mathfrak{A}$ is called <u>subregular</u> if any congruence θ on $\mathfrak{A}$ is uniquely determined by its classes $[b]\theta$, $b \in \mathfrak{B}$, for every subalgebra $\mathfrak{B}$ of $\mathfrak{A}$.

<u>Theorem</u>. For any variety V, the following conditions are equivalent:

(1) Every algebra $\mathfrak{A} \in V$ is subregular;

(2) There exist unary polynomials $u_1,\dots,u_n$, ternary polynomials $p_1,\dots,p_n$ and 4-ary polynomials $s_1,\dots,s_n$ such that

$x = s_1(x,y,z,u_1(z))$

$s_i(x,y,z,p_i(x,y,z)) = s_{i+1}(x,y,z,u_{i+1}(z))$ for $1 \leq i < n$

$y = s_n(x,y,z,p_n(x,y,z))$

$u_i(z) = p_i(x,x,z)$ for $1 \leq i \leq n$;

(3) There exist unary polynomials $u_1,\dots,u_n$ and ternary polynomials $p_1,\dots,p_n$ such that

$(u_i(z) = p_i(x,y,z),\ 1 \leq i \leq n) \Longleftrightarrow x = y.$

References

[1] J. TIMM: On regular algebras, in Contributions to universal algebra, Proceedings of the Colloquium held in Szeged, 1975. Coll. Math. Soc. J. Bolyai, Vol. 17. Norht-Holland, Amsterdam 1977, pp. 503-514.

EXISTENCE AND MULTIPLICITY RESULTS FOR NONLINEAR NONCOERCIVE EQUATIONS

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We assume that $L:D(L) \subset L^2(\Omega) \longrightarrow L^2(\Omega)$ is linear selfadjoint operator with dense domain D(L) and closed range R(L). Let 0 be an eigenvalue of L and let for the corresponding eigenspace $\dim N(L) < +\infty$; $L^2(\Omega) = N(L) \oplus R(L)$. We assume that the functions in N(L) satisfy the "unique continuation property" (i.e. the only function w N(L) which is vanishing on