Implicit definition of the quaternary discriminator

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Let $\mathbf{A}$ be an algebra. A function $f : A^n \to A$ is *implicitly definable* by a system of term equations $\bigwedge t_i(x_1, \ldots, x_n, z) = s_i(x_1, \ldots, x_n, z)$ if f is the only n-ary operation on A making the identities $t_i(\vec{x}, f(\vec{x})) \approx s_i(\vec{x}, f(\vec{x}))$ hold in $\mathbf{A}$. Let $\mathcal{K}$ be a class of non trivial algebras. We prove that the quaternary discriminator is implicitly definable on every member of $\mathcal{K}$ (via the same system) iff $\mathcal{K}$ is contained in the class of relatively simple members of some relatively semisimple quasivariety with equationally definable relative principal congruences. The results in this talk are the joint work of Diego Vaggione and the author.

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