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Michael Chris Laskowski*, Department of Mathematics, University of Maryland, College Park, MD 20742. *Algebraic existential quantifiers.*

Call a formula $\psi(\bar{y})$ *algebraically existential* if it is equivalent to $\exists \bar{x}\varphi(\bar{x}, \bar{y})$, where φ is quantifier free and there is a uniform bound k_φ such that $\varphi(\bar{x}, \bar{b})$ has at most k_φ solutions for every \bar{b} from every model of the theory. We discuss a variant of model completeness in which every formula is equivalent to a boolean combination of such formulas. Examples of theories with this property include the elementary diagrams of arbitrarily colored symmetric graphs, whose valence is uniformly bounded by some integer. More generally, the elementary diagram of every *mutually algebraic* theory admits elimination of quantifiers down to boolean combinations of algebraically existential formulas. (Received September 16, 2013)