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Algebraic independence of solutions to multiple Lotka-Volterra systems

A major problem in recent applications of the model theory of DCF_0 is determining when a given system of algebraic differential equations defines a strongly minimal set. A definable set S is *strongly minimal* if it is infinite and for any other definable set R (over any set of parameters), either $S \cap R$ or $S \setminus R$ is finite. In joint work with Yutong Duan and Léo Jimenez, we classify exactly when the solution set to a Lotka-Volterra system is strongly minimal. In the strongly minimal case, we classify all algebraic relations between Lotka-Volterra systems and show that for any distinct solutions $x_1, \dots, x_n$ (not in the algebraic closure of the base field F), $\text{trdeg}(x_1, \dots, x_m/F) = 2m$.