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A refinement of a theorem of Carlitz

We refine some results of Carlitz about the existence of non-trivial solutions of polynomial equations in several variables Y_1, \dots, Y_n and coefficients in $F_q[X]$ by considering the p -weight degrees of the polynomials. We also present an extension of a theorem of Moreno and Moreno that gives a bound on the p -divisibility of the number of solutions of this type of systems.