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Jonathan D Hauenstein, Bernard Mourrain and Agnes Szanto* (aszanto@ncsu.edu),
Department Of Mathematics, NCSU, Campus Box 8205, Raleigh, NC 27695. *On the multiplicity
structure of isosingular roots.*

We present a new construction to compute the so-called inverse system or dual basis for singular solutions of polynomial systems. We construct a system of equations in the original variables plus a relatively small number of new variables that completely deflates the root in one step. We show that the isolated simple solutions of this new system correspond to roots of the original system with given multiplicity structure up to a given order. This construction is “exact” in that it permits one to treat all conjugate roots simultaneously and can be used in certification procedures for singular roots and their multiplicity structure with respect to an exact rational polynomial system. (Received January 14, 2016)