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Liouville-type theorems and decay estimates for solutions to higher order elliptic equations

Abstract. Liouville-type theorems are powerful tools in partial differential equations. Boundedness assumption of solutions are often imposed in deriving such Liouville-type theorems. We establish some Liouville-type theorems without the boundedness assumption of nonnegative solutions to certain classes of elliptic equations and systems. Using a rescaling technique and doubling lemma developed recently, we improve several Liouville-type theorems in higher order elliptic equations, some semi-linear equations and elliptic systems. More specifically, we remove the boundedness assumption of the solutions which is required in the proofs of the corresponding Liouville-type theorems in the recent literature. Moreover, we also investigate the singularity and decay estimates of higher order elliptic equations.
