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**John Villavert\*** ([john.villavert@colorado.edu](mailto:john.villavert@colorado.edu)), Department of Applied Mathematics, 526 UCB, Boulder, CO 80309-0526. *Shooting with Degree Theory: Existence Results for Some Weighted Polyharmonic Systems.*

The existence of positive solutions to a general class of non-autonomous, semilinear elliptic systems including weighted Lane–Emden and Hardy–Littlewood–Sobolev type systems is shown. This is achieved by adopting a novel framework that implements the classical shooting method enhanced by the degree theory. Namely, a target map is first constructed which aims the shooting method, then the non-degeneracy conditions are introduced which guarantees the continuity of this target map. This continuity property in conjunction with the degree theory will show the target map is onto. Then it is illustrated how the surjectivity of the map combined with a Liouville type theorem for the corresponding Dirichlet problem will imply the existence of positive solutions to the class of systems in consideration. (Received February 17, 2013)