## An action approach to nodal and least energy normalized solutions for nonlinear Schrödinger equations

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Abstract. We develop a new approach to the investigation of normalized solutions for nonlinear Schrödinger equations based on the analysis of the masses of ground states of the corresponding action functional. Our first result is a complete characterization of the masses of action ground states, obtained via a Darboux-type property for the derivative of the action ground state level. We then exploit this result to tackle normalized solutions with a twofold perspective. First, we prove existence of normalized nodal solutions for every mass in the  $L^2$ -subcritical regime, and for a whole interval of masses in the  $L^2$ -critical and supercritical cases. Then, we show when least energy normalized solutions/least energy normalized nodal solutions are action ground states/nodal action ground states.