On an abstract bifurcation result concerning homogeneous potential operators with applications to PDEs

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Abstract. We study an abstract equation in a reflexive Banach space, depending on a real parameter λ. The equation is composed by homogeneous potential operators. By analyzing the Nehari sets, we prove a bifurcation type result. In some particular cases we describe the full bifurcation diagram, and in general, we estimate the parameter λ_b for which the problem does not have non-zero solution where $\lambda > \lambda_b$. We give many applications to partial differential equations: Kirchhoff type equations, Schrödinger equations coupled with the electromagnetic field, Chern-Simons-Schrödinger systems and a nonlinear eigenvalue problem.