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Non-linear elliptic operators on a compact manifold and an implicit function theorem.

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The author studies the C^∞ solution space for a nonlinear elliptic differential operator on a compact manifold by considering the solutions of the linearized homogeneous problem. The basic idea is to consider an associated bifurcation operator and use the theory of linear elliptic operators to prove an implicit function theorem in the appropriate Fréchet space. This theory applies to the operator on a Riemannian manifold M that maps $f \in C^\infty(M, M)$ to the metric induced by f. The author works in the global analysis framework of R. S. Palais [*Foundations of global non-linear analysis*, Benjamin, New York, 1968; MR0248880 (40 #2130)].

Reviewed by *H. Jacobowitz*