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Generalized Fountain Theorem and Application to the Semilinear Schrödinger Equation

Fountain theorems and their variants have proven to be effective tools in studying the existence of infinitely many solutions of partial differential equations. By using the degree theory and the $\tau-$topology of Kryszewski and Szulkin, we establish a version of the Fountain Theorem for strongly indefinite functionals. This abstract result will be applied for studying the existence of infinitely many solutions of two strongly indefinite semilinear problems including the semilinear Schrödinger equation.