An Index Interpretation for The Number of Limit Cycles of A Vector Field

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We present a new interpretation for the number of limit cycles of a vector field $X$ in term of fredholm index of the functional operator $X(g) = X.g$ This Interpretation which is stated for a particular vector field (lienard equation see below), is an attempt to give a new formulation for Hilbert 16th Problem: find the fredholm index of a family of Operators.

\[
\begin{align*}
\dot{x} &= y - F(x) \\
\dot{y} &= -x
\end{align*}
\]