

## 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.

$$\begin{cases} \dot{x} &= y - F(x) \\ \dot{y} &= -x \end{cases}$$