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Geometrical proofs for the global solvability of systems. (English) Zbl 1406.58015

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Summary: We study a linear operator associated with a closed non-exact 1-form b defined on a smooth closed orientable surface M of genus $g > 1$. Here we present two proofs that reveal the interplay between the global solvability of the operator and the global topology of the surface. The first result brings an answer for the global solvability when the system is defined by a generic Morse 1-form. Necessary conditions for the global solvability bearing on the sublevel and superlevel sets of primitives of a smooth 1-form b have already been established; we also present a more intuitive proof of this result.

MSC:

58J10 Differential complexes

35A01 Existence problems for PDEs: global existence, local existence, non-existence

35N10 Overdetermined systems of PDEs with variable coefficients

Cited in 1 Document

Keywords:

complex vector fields; global solvability; involutive systems

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