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Globally analytic hypoelliptic vector fields on compact surfaces. (English) Zbl 1139.35038
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This paper deals with complex, non-singular, real analytic vector field L defined on a compact, connected, orientable, two-dimensional, real analytic manifold M . The authors call L vector field of type I if $\operatorname{Re} L$, $\operatorname{Im} L$ are linearly independent everywhere on M . Otherwise, L is called vector field of type II. A complete characterization of the global analytic hypoelliptic vector fields of types I and II is given. It follows from their results that in the class of compact surfaces M , globally analytic hypoelliptic vector fields can exist only if M is real analytically diffeomorphic to the two-torus \mathbb{T}^2 .

Reviewer: [Petar Popivanov \(Sofia\)](#)

MSC:

[35H10](#) Hypoelliptic equations
[58J99](#) Partial differential equations on manifolds; differential operators

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[Liouville numbers](#); [sheaf cohomology](#); [Sussmann orbits](#)

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