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## The lie derivative and cohomology of G-structures

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### Abstract

In [1], J.F. Pommaret constructed the so-called Spencer P-complex for a differential operator. Applying this construction to the Lie derivative associated with a general pseudogroup structure on a smooth manifold, he defined the deformation cohomology of a pseudogroup structure. The aim of this paper is to specify this complex for a particular case of pseudogroup structure, namely, for a first-order G-structure, and to express this complex in differential geometric form, i.e., in terms of tensor fields and the covariant derivative. We show that the Pommaret construction provides a powerful tool for associating a differential complex to a G-structure. In a unified way one can obtain the Dolbeaut complex for the complex structure, the Vaisman complex for the foliation structure [2], and the Vaisman-Molino cohomology for the structure of manifold over an algebra [3].

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