



# Techniques of computations of Dolbeault cohomology of solvmanifolds

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We consider semi-direct products  $\mathbb{C}^n \ltimes_{\phi} \mathbb{N}$  of Lie groups with lattices  $\Gamma$  such that  $\mathbb{N}$  are nilpotent Lie groups with left-invariant complex structures. We compute the Dolbeault cohomology of direct sums of holomorphic line bundles over  $G/\Gamma$  by using the Dolbeault cohomology of the Lie algebras of the direct product  $\mathbb{C}^n \ltimes \mathbb{N}$ . As a corollary of this computation, we can compute the Dolbeault cohomology  $H^{p,q}(G/\Gamma)$  of  $G/\Gamma$  by using a finite dimensional cochain complexes. Computing some examples, we observe that the Dolbeault cohomology varies for choices of lattices  $\Gamma$ .

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