A generalization of the Castelnuovo-de Franchis inequality

VÍCTOR GONZÁLEZ-ALONSO

Abstract. In this article we give a lower bound on $h^{2,0}(X)$, where X is an irregular compact Kähler (or smooth complex projective) variety, in terms of the minimal rank of an element in the kernel of

$$\psi_2 : \bigwedge^2 H^0\left(X, \Omega_X^1\right) \to H^0\left(X, \Omega_X^2\right).$$

As a consequence, we obtain a generalization to higher dimensions of the Castelnuovo-de Franchis inequality for surfaces, improving some results of Lazarsfeld and Popa and Lombardi for threefolds and fourfolds.

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