

Recently, the Bott-Chern cohomology and $\ddot{\bar{d}}$ -lemma are playing important role in the study of non-Kähler complex manifolds. From the birational viewpoint, we derive a blow-up formula of Bott-Chern cohomology for compact complex manifolds. As an application, we show that the non-Kählerness degrees introduced by Angella-Tomassini, are birational invariants of compact complex 3-folds; and consequently the $\ddot{\bar{d}}$ -lemma is a birational invariant of compact complex 3-folds. This is a joint work with Xiangdong Yang.