

## On local holomorphic maps between Kähler manifolds preserving $(p, p)$ -forms

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**Abstract.** We study local holomorphic maps between Kähler manifolds preserving  $(p, p)$ -forms. In this direction, we prove that any such local holomorphic map  $F$  is a holomorphic isometry, up to a scalar constant, provided that  $p$  is strictly less than the complex dimension of the domain of  $F$ . We then study local holomorphic maps between finite-dimensional complex space forms preserving invariant  $(p, p)$ -forms. It was proved by Calabi that there does not exist a local holomorphic isometry between complex space forms  $M$  and  $N$  provided that  $M$  and  $N$  are of different types. In this article, we generalize this result to local holomorphic maps between complex space forms  $M$  and  $N$  preserving invariant  $(p, p)$ -forms whenever  $M$  and  $N$  are of different types except for the case where the universal covers of  $M, N$  are biholomorphic to  $\mathbb{C}^m, \mathbb{P}^n$ , respectively, and  $2 \leq p = m < n$ . We also obtain some results in more general settings, including the study on indefinite Kähler manifolds and relatives for Kähler manifolds.

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