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**Mainak Poddar\*** (mpoddar@metu.edu.tr), Mathematics Group, Middle East Technical University, Northern Cyprus Campus, Kalakanli, 99738 Guzelyurt, Mersin 10, Turkey, and **Ajay Singh Thakur**. *Complex and SKT structures on the total space of principal bundles.*

We present a new construction of non-Kähler complex manifolds that generalizes the construction of complex structures on compact even dimensional Lie groups by Samelson and Wang, as well as the Calabi-Eckmann construction of complex structures on the product to two odd dimensional spheres. We give sufficient conditions for the existence of SKT structures on a large class of these.

Let  $G$  be a complex linear algebraic group and let  $K$  be a maximal compact Lie subgroup of  $G$ . Let  $E_K \rightarrow M$  be a smooth principal  $K$ -bundle over a complex manifold  $M$ . Assume that  $E_K \rightarrow M$  can be obtained by a smooth reduction of structure group from a holomorphic principal  $G$ -bundle over  $M$ . Then  $E_K$  (respectively,  $E_K \times S^1$ ) admits a family of integrable complex structures if  $K$  has even dimension (respectively, odd dimension).

When  $K$  is an even dimensional unitary, special orthogonal or compact symplectic group and  $M$  is a projective manifold, we can choose complex structures on  $E_K$  so that it admits a family of SKT structures if the characteristic classes of  $E_K \rightarrow M$  satisfy some simple conditions. Formulas for the Picard group and the algebraic dimension of  $E_K$  are obtained when, in addition,  $K$  is simply connected. (Received September 25, 2017)