

Flag Bott manifolds and the toric closure of generic orbit associated to a generalized Bott manifold

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A Bott manifold (also called a Bott tower) is a special type of iterated $\mathbb{C}P^1$ bundles which was introduced in the work of Grossberg-Karshon [3]. Grossberg-Karshon show that Bott manifolds are toric varieties (toric manifolds) and some of them are obtained by a certain limit of Bott-Samelson varieties. Since the work of Grossberg-Karshon, this class of manifolds has been often appeared in several areas of mathematics. In particular, toric topologists generalize this class of manifolds to iterated complex projective bundles with arbitrary dimensions (called a generalized Bott manifold, see [2, 5]). Their main motivation is to verify the cohomological rigidity problem of special class of toric manifolds which asks whether the class of toric manifolds are topologically classified by their integral cohomology rings, also see [1] (note that generalized Bott manifolds are toric manifolds). Of course, this generalization is one of the natural generalizations of Bott manifolds. However, it seems to be difficult to find the counterpart of Bott-Samelson varieties unlike Bott manifolds. In this talk, we generalize Bott manifolds from the another point of view; namely, we regard $\mathbb{C}P^1$ as the flag manifold and introduce the special type of iterated flag manifold bundles (called a *flag Bott manifold*), and we also introduce some basic properties of flag Bott manifolds.

This talk is based on the paper [4] which is the joint project with Eunjeong Lee, Jongbaek Song and Dong Youp Suh.

References

- [1] S. Choi, M. Masuda, and D. Y. Suh, *Quasitoric manifolds over a product of simplices*, Osaka J. Math. **47** (2010), no. 1, 109–129.
- [2] N. E. Dobrinskaya, *The classification problem for quasitoric manifolds over a given polytope*, Funktsional. Anal. i Prilozhen. **35** (2001), 3–11.
- [3] M. Grossberg and Y. Karshon, *Bott towers, complete integrability, and the extended character of representations*, Duke Math. J. **76** (1994), 23–58.
- [4] S. Kuroki, E. Lee, J. B. Song and D. Y. Suh, *Flag Bott manifolds and the toric closure of a generic orbit associated to a generalized Bott manifold*, arXiv:1708.02082.
- [5] M. Masuda and D. Y. Suh, *Classification problems of toric manifolds via topology*, Toric topology, Contemp. Math., vol. 460, Amer. Math. Soc., Providence, RI, 2008, pp. 273–286.