Toric manifolds over an n-cube with one vertex cut

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Toric manifolds (= compact smooth toric varieties) over an n-cube are known as Bott manifolds (or Bott towers) and their topology is well studied. The blow up of Bott manifolds at a fixed point provides toric manifolds over an n-cube with one vertex and they are all projective since so are Bott manifolds. On the other hand, Oda's 3-fold, which is known as the simplest non-projective toric manifold, is over a 3-cube with one vertex cut. In this talk, we classify toric manifolds over an n-cube with one vertex cut as varieties and also as smooth manifolds. It turns out that there are many non-projective toric manifolds over an n-cube with one vertex cut (we can even count them in each dimension) but surprisingly they are all diffeomorphic.

If time permits, I will talk about toric manifolds over a product of simplices with a face cut, which is a generalization of an n-cube with one vertex cut. This work is ongoing.

This is joint work with Sho Hasui, Mikiya Masuda and Seonjeong Park.

References

[1] H. Hasui, H. Kuwata, M. Masuda and S. Park Classification of toric manifolds over an n-cube with one vertex cut arXiv:1705.07530