

# Convexity of the base space for singular Lagrangian fibrations

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## Abstract

The Strominger-Yau-Zaslow fibration is an example of a singular Lagrangian torus fibration of a symplectic manifold  $M^{2n}$ . In the toric case when there is  $n$  global sections for the sheaf of  $S^1$ -action that preserve the fibration, the Atiyah - Guillemin & Sternberg theorem [Ati82], [GS82], [GS84] proves that we can identify the base space with the image of the moment map for the  $n$ -torus action, and that it is a convex polytope in  $\mathbb{R}^n$ .

In *almost-toric* systems, one allows so-called focus-focus singularities to occur, which in turn destroys some of the  $S^1$ -actions. For these almost-toric systems, the affine structure becomes singular and the image of the moment map is not a convex polytope of  $\mathbb{R}^n$  in general. In this poster, I will present the notion of *intrinsic convexity* of the base space with respect to its (singular) affine structure, and give local and global convexity results for the base space we obtained in this case.

This is a joint project with Tudor Ratiu<sup>1</sup> and Nguyen Tien Zung<sup>2</sup>. Arxiv: 1706.01093

## References

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- [GS82] V. Guillemin and S. Sternberg. Convexity properties of the moment mapping. *Inventiones Mathematicae*, 67:491–513, 1982. 10.1007/BF01398933.
- [GS84] V. Guillemin and S. Sternberg. Convexity properties of the moment mapping. ii. *Inventiones Mathematicae*, 77:533–546, 1984. 10.1007/BF01388837.

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