

Lian, Bong H.; Song, Ruifang; Yau, Shing-Tung**Periodic integrals and tautological systems.** (English) Zbl 1272.14033

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The authors' purpose of this important paper is to study period integrals and deformations of CY complete intersections in homogeneous spaces. They mostly restrict to partial flag varieties. After clear and very intuitive introduction the authors prove that the universal family of CY manifolds is deformation complete. Next, they give an explicit construction of D -modules that governs the period integrals. In order to achieve this construction they introduce a special type of differential systems called *tautological*. More precisely, for a fixed reductive algebraic group G , to every G -variety X equipped with a very ample equivariant line bundle L , they attach a system of differential operators defined on $H^0(X, L)$, depending on a group character. They show that the system is regular holonomic when X is a homogeneous space. A number of illuminating examples are discussed. In the last section of the paper, they discuss several numerical examples and their solutions.

Reviewer: [Zbigniew Hajto \(Kraków\)](#)**MSC:**

- [14J32](#) Calabi-Yau manifolds (algebraic-geometric aspects)
- [14M15](#) Grassmannians, Schubert varieties, flag manifolds
- [14J45](#) Fano varieties
- [34M55](#) Painlevé and other special ordinary differential equations in the complex domain; classification, hierarchies
- [14D05](#) Structure of families (Picard-Lefschetz, monodromy, etc.)
- [33C80](#) Connections of hypergeometric functions with groups and algebras, and related topics

Cited in **4** Reviews
Cited in **3** Documents**Keywords:**[Calabi-Yau](#); [period integrals](#); [Picard-Fuchs systems](#); [partial flag varieties](#)**Full Text:** [DOI](#) [arXiv](#)**References:**

- [1] Adolphson, A.: Hypergeometric functions and rings generated by monomials. Duke Math. J. 73, 269-290 (1994) · [Zbl 0804.33013](#) · [doi:10.1215/S0012-7094-94-07313-4](#)

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