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Period integrals and the Riemann-Hilbert correspondence. (English) Zbl 1387.14042
J. Differ. Geom. 104, No. 2, 325-369 (2016).

A tautological system, introduced in [*B. H. Lian* et al., *J. Eur. Math. Soc. (JEMS)* 15, No. 4, 1457–1483 (2013; [Zbl 1272.14033](#))] and [*B. H. Lian* and *S.-T. Yau*, *Invent. Math.* 191, No. 1, 35–89 (2013; [Zbl 1276.32004](#))], arises as a regular holonomic system of partial differential equations that governs the period integrals of a family of complete intersections in a complex manifold X , equipped with a suitable Lie group action. A geometric formula for the holonomic rank of such a system was conjectured in [*S. Bloch* et al., *J. Differ. Geom.* 97, No. 1, 11–35 (2014; [Zbl 1318.32027](#))], and was verified for the case of projective homogeneous space under an assumption. In this paper, the authors prove this conjecture in full generality. By means of the Riemann-Hilbert correspondence and Fourier transforms, they also generalize the rank formula to an arbitrary projective manifold with a group action.

Reviewer: [Ruifang Song \(Mountain View\)](#)

MSC:

- [14D05](#) Structure of families (Picard-Lefschetz, monodromy, etc.)
- [14C30](#) Transcendental methods, Hodge theory (algebraic-geometric aspects)
- [14D07](#) Variation of Hodge structures (algebraic-geometric aspects)
- [53D37](#) Symplectic aspects of mirror symmetry, homological mirror symmetry, and Fukaya category

Cited in 1 Review
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Keywords:

period integrals; Picard-Fuchs systems; family of complete intersections; tautological systems; regular holonomic D-modules; Riemann-Hilbert correspondence; Fourier transform

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