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Sommario/riassunto

This research monograph provides a comprehensive study of a conjecture initially proposed by the second author at the 1998 International Congress of Mathematicians (ICM). This conjecture asserts the equivalence, for a Fano variety, between the semisimplicity condition of its quantum cohomology and the existence of full exceptional collections in its derived category of coherent sheaves. Additionally, in its quantitative form, the conjecture specifies an explicit relation between the monodromy data of the quantum cohomology, characteristic classes, and exceptional collections. A refined version of the conjecture is introduced, with a particular focus on the central connection matrix, and a precise link is established between this refined conjecture and -conjecture II, as proposed by S. Galkin, V. Golyshev, and H. Iritani. By performing explicit calculations of the monodromy data, the validity of the refined conjecture for all complex Grassmannians G(r,k) is demonstrated. Intended for students and researchers, the book serves as an introduction to quantum cohomology and its isomonodromic approach, along with its algebraic counterpart in the derived category of coherent sheaves.