

Asymptotic analysis for a confluent KZ equation in two variables

Yoshishige Haraoka (Kumamoto University)

We are interested in asymptotic analysis of completely integrable systems of irregular singular type in several variables. Majima (LNM **1075**, Springer, 1984) gave a fundamental idea of asymptotic expansion in several variables, and developed a general theory. Shimomura (Proc. Royal Soc. Edinbrgh, **123** (1993), 1165-1177; J. Math. Anal. Appl., **187** (1994), 468-484) studied asymptotic behaviors of some confluent hypergeometric functions in two variables in a different way from Majima's asymptotics.

The asymptotic analysis in several variables seems to be difficult because there were few examples of completely integrable systems. In applying the Katz theory on rigid local systems, we get a way of constructing completely integrable systems in a recursive way, and can obtain infinitely many examples. These examples will be helpful to develop a general theory.

In this talk, we study a confluent KZ equation of rank four in two variables (x, y) with irregular singularity at $x = \infty$ and $y = \infty$. We will analyze these singularities in Shimomura's way and in Majima's way.