

Relation between the hypergeometric function and WKB solutions

MIKA TANDA, TAKASHI AOKI*, TOSHINORI TAKAHASHI*

Department of Medical, Kansai Medical University, Japan

Email: tanda.mika@gmail.com

We consider the Gauss hypergeometric differential equation with a large parameter from the viewpoint of the exact WKB analysis. We introduce a large parameter η in the parameters of the Gauss hypergeometric equation as general linear forms of η . As is well known, the Gauss hypergeometric differential equation has a system of fundamental solutions (w_0, w_1) which are expressed in term of hypergeometric functions. On the other hand, the Gauss hypergeometric differential equation with a large parameter has another system of fundamental solutions which are defined by Borel sums (Ψ_+, Ψ_-) of WKB solutions. We investigate linear relations which hold between (w_0, w_1) and (Ψ_+, Ψ_-) . These relations give asymptotic expansion formulas for the hypergeometric function with respect to the large parameter.