

On the Borel summability of WKB solutions near a simple pole**07.10****Gergő Nemes***(Alfréd Rényi Institute of Mathematics, Budapest, Hungary)***Time:** Tuesday 23.07., 16:30 - 17:00, Room HS 5**Abstract:** We consider the following Schrödinger-type differential equation:

$$\frac{d^2 W(u, \xi)}{d\xi^2} = (u^2 + \psi(\xi))W(u, \xi),$$

where u is a large positive parameter and $\psi(\xi)$ is an analytic function of ξ apart from countably many singularities. It is known that this equation has formal solutions of the form

$$W_{1,2}(u, \xi) = e^{\pm \xi u} \sum_{n=0}^{\infty} \frac{A_n(\pm \xi)}{u^n}.$$

These are called the WKB solutions. We study the Borel summability of these WKB solutions near a simple pole of the function $\psi(\xi)$ which we assume to be located at the origin. It is shown that both of the formal series are Borel summable in every closed strip $\{\xi : |\Im \xi| \leq \gamma\}$ contained in the domain of analyticity of $\psi(\xi)$ apart from the Stokes rays $\arg \xi = 0, 2\pi$ and $\arg \xi = \pm\pi$ emanating from the origin. We determine the type of singularities of the Borel transforms near the origin when $|\xi|$ is small and also provide global connection formulae between the solutions $W_1(u, \xi)$ and $W_2(u, \xi)$.