# SEMI-GLOBAL UNIFORM ASYMPTOTICS OF WAVE FIELDS WITH CUSP TYPE CAUSTICS VIA THE PEARCEY FUNCTION AND ITS DERIVATIVES

S. Yu. Dobrokhotov,[1] V. E. Nazaikinskii,[2] A. A. Tolchennikov,[3]
B. I. Suleimanov[4]

We discuss an efficient approach to constructing uniform asymptotics of integrals describing the behavior of various wave fields with cusp type caustics. The answer is semi-global, i.e., is defined on an open set containing the caustic cusp and independent of the small parameter, and is expressed via the Pearcey function and its derivative whose arguments are functions given in parametric form and determined by the corresponding Lagrangian manifold. By way of example, we consider an exact solution of the Cauchy problem for the one-dimensional nonstationary Schrodinger equation for a free particle.

The research was supported by the Russian Science Foundation (project 24-11-00213) at Ishlinsky Institute for Problems in Mechanics RAS.

[1] Ishlinsky Institute for Problems in Mechanics RAS;
Moscow Institute of Physics and Technology
e-mail: s.dobrokhotov@gmail.com

[2] Ishlinsky Institute for Problems in Mechanics RAS;
Moscow Institute of Physics and Technology
e-mail: nazaikinskii@googlemail.com

[3] Ishlinsky Institute for Problems in Mechanics RAS;
Moscow Institute of Physics and Technology
e-mail: tolchennikovaa@gmail.com

[4] Institute of Mathematics of Ufa Federal Research Center RAS, Ufa
e-mail: bisul@mail.ru