

Finite Rank Solutions of Euler-Poisson-Darboux Equations

Fritz Schwarz^{1,a)}

¹*Fraunhofer Gesellschaft, Institut SCAI, Schloss Birlinghoven, 53757 Sankt Augustin, Germany*

^{a)}fritz.schwarz@scai-extern.fraunhofer.de

URL: <https://www.scai.fraunhofer.de/de/ueber-uns/mitarbeiter/schwarz.html>

Abstract. The subject of this article are so-called finite rank solutions originally introduced by Laplace for second-order linear partial differential equations (pde's) in the plane. They consist of linear combinations of undetermined functions and their derivatives up to a certain order called their *rank*. In this article a method is proposed in order to determine finite rank solutions for linear pde's of any order in any number of independent variables. It is worked out in detail for Euler-Poisson-Darboux equations in one, two or three space variables, and numerous solutions are explicitly given. The extension of this proceeding to general linear pde's are discussed.