

The exact analytical solutions of Einstein's equations describing systems of astrophysical interest have not been found yet, and thus they have to be studied only as perturbations of known spacetimes. There are various ways to investigate these perturbations. One can look directly for perturbations of metric of the exact solution of Einstein's equations. In vacuum spacetimes of type D, it has proved advantageous to investigate perturbations in the GHP formalism by introducing the Debye potential. In this paper, we discuss the connection between these two approaches. We present a general procedure for translating the results from the Debye potential formalism to stationary axisymmetric perturbations of the Kerr metric. This procedure requires solving for a calibration vector. We show that both approaches lead to the same perturbation of the radiative components of the Weyl tensor, and we find a simple relation between these components.