

In 1974, Will presented a solution for the perturbation of a Schwarzschild black hole due to a slowly rotating and light thin disc given in terms of a multipole expansion of the perturbation series. In a recently submitted paper, P. Čížek and O. Semerák generalized this procedure to the perturbation by a slowly rotating finite thin disc, using closed forms of Green functions rather than the multipole expansion. The method is illustrated there, in the first perturbation order, on the constant-density disc. In this thesis, we summarize, check and plot some of the obtained properties, and show how the presence of the disc changes the geometry of a horizon and the position of significant circular orbits.