

Abstract: In Newtonian physics, it is possible to establish static equilibrium in a system, which consists of extremal sources of gravitational and electromagnetic field. Surprisingly, this situation can occur in general relativity for black holes, too. This work examines a special case involving an infinitely long, straight, extremally charged string, studies its geometry, electrogeodesics, properties of the source and compares the solution to Newtonian physics. We also investigate an analogous situation in a dynamic spacetime with cosmological constant, and we compare it to the static version. Finally, we investigate a periodical solution of Laplace's equation corresponding to infinitely many extremal point sources distributed at regular intervals along a straight line. We study the properties of the electrostatic potential and show that in the limit of large distances from the axis formed by the sources, the solution approaches the charged string.