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On the Kerr solution

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Calculations are carried out, on the base of which the limitations are revealed under which the general exact solution for the gravitational field, created by a uniformly rotating configuration, is reduced to the Kerr solution. It is found that in the derivation of the Kerr solution all the multipole moments are discarded and, in addition to the integration constant which define the mass of configuration, a parameter is introduced which is responsible for the rotation. Already in the first paper by Kerr, it was noted that the solution is an example of algebraically special metric of the same class as the known solution NUT. This allowed to reveal that the Kerr solution is a particular case of the known four-parameter solution which is obtained under the assumption of the potential nature of the angular velocity of the worldlines configuration, forming the used commoving coordinate system.

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