Title: Regularity criteria for instationary incompressible Navier–Stokes equations

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Abstract: In the present thesis we study the global conditional regularity of weak solutions to the Cauchy problem for instationary incompressible Navier–Stokes equations in three space dimensions. In the first section, we present an overview of known conditions implying the full regularity of the equations under consideration. For the sake of clarity, we expose only the regularity criteria on the scale of Lebesgue spaces, especially in terms of the velocity and its components, the gradient of the velocity and its components, the pressure and the vorticity. In the subsequent sections, we generalize four regularity criteria using two different techniques. We are able to replace one velocity component or its gradient, considered in the known results, by a projection of the velocity into a general vector field. For the purpose of the second method, we also generalize the multiplicative Gagliardo–Nirenberg inequality.