A Global L^p-Gradient Estimate on Weak Solutions of Nonlinear Parabolic Systems under Mixed Boundary Conditions

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Abstract

In this paper, we prove the integrability of the spatial gradient Du to an exponent $p > 2$ near the boundary, u being a weak solution of a nonlinear parabolic system under mixed boundary conditions. Our method of proof relies on an adaption of a technique by Gehring-Giaquinta-Modica (higher integrability by reverse Hölder inequality) to cubes which possibly intersect a hyperplane. Combined with the interior estimate in (Naumann, J.; Wolff, M.: *Interior integral estimates on weak solutions of nonlinear parabolic systems*. – Preprint no. 94-12; Fachber. Math., Humboldt-Univ.) we obtain a global L^p-gradient estimate.