BOUNDEDNESS AND REGULARITY OF THE SOLUTIONS OF A KIND OF NONLINEAR SYSTEMS

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ABSTRACT

We deal with nonlinear systems of elliptic and parabolic type

$$\operatorname{div} \boldsymbol{A}(x, \boldsymbol{u}, D\boldsymbol{u}) + \boldsymbol{b}(x, \boldsymbol{u}, D\boldsymbol{u}) = 0 \quad x \in \Omega$$

$$\boldsymbol{u}_t - \operatorname{div} \boldsymbol{A}(x, t, \boldsymbol{u}, D\boldsymbol{u}) + \boldsymbol{b}(x, t, \boldsymbol{u}, D\boldsymbol{u}) = 0 \quad (x, t) \in Q_T$$

satisfying componentwise structural conditions. The nonlinear terms are Carathéodory maps having controlled growth with respect to the solution and the gradient and the data are in suitable Lebesgue and Morrey spaces. Under these assumptions we obtain essential boundedness of the weak solutions and in the elliptic case also optimal Morrey regularity for the solutions.

References

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