

# Higher differentiability results for elliptic equations with lower order terms

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Let us consider the Dirichlet problem

$$\begin{cases} \operatorname{div}(A(x, Du)) + b(x)|u(x)|^{p-2}u(x) = f & \text{in } \Omega \\ u = 0 & \text{on } \partial\Omega \end{cases} \quad (1)$$

For  $p = 2$  we establish higher differentiability of solutions to problem (1) under a Sobolev assumption on the partial map  $x \rightarrow A(x, \xi)$ .

Moreover, we will deal also with degenerate elliptic operator  $A(x, \xi)$ , with  $p$ -growth,  $p \geq 2$ , with respect to the gradient variable, obtaining, also in this case, boundedness and higher differentiability of the solutions.

The novelty, in both cases, is that we take advantage from the regularizing effect of the lower order term, due to the interplay between  $b(x)$  and  $f(x)$ .

## REFERENCES

- [1] C. Capone, T. Radice, *Higher differentiability for solutions to a class of elliptic equations with lower order terms*, Journal of Elliptic and Parabolic Equations, 6 (2), (2020), 751–771.
- [2] C. Capone *On the regularity of solutions of degenerate PDEs with lower order terms*, submitted to Journal of Mathematical Analysis and Applications (2021).