Elliptic Systems with Superlinear Terms on the Critical Hyperbola

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We focus on semilinear elliptic systems involving a nonlinearity of slightly subcritical nature understood in a generalized sense. For this problem, standard compact embeddings cannot be used to guarantee the existence of solutions as in the case of power-type nonlinearities. Instead, we use the dual method on Orlicz spaces. Roughly speaking, this method consists in taking the inverse of the Laplace operator, and defining the inverse of the nonlinearities. We state sufficient conditions guaranteeing the Palais-Smale condition, showing that our problem possesses a mountain pass type solution.

This is a joint work with Mabel Cuesta and Angela Pistoia, see [1].

References

[1] M. Cuesta, R. Pardo, and A. Pistoia. Positive solutions of elliptic systems with superlinear terms on the critical hyperbola. *Milan J. Math.*, 92(2):439–472, 2024.