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Critical elliptic equations on non-compact Finsler manifolds

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Abstract. In the present paper, we deal with a quasilinear elliptic equation involving a critical Sobolev exponent on non-compact Randers spaces. Under very general assumptions on the perturbation, we prove the existence of a non-trivial solution. The approach is based on the direct methods of the calculus of variations. One of the key steps is to prove that the energy functional associated with the problem is weakly lower semicontinuous on small balls of the Sobolev space, which is provided by a general inequality. In the end, we prove Hardy-type inequalities on Finsler manifolds as an application of this inequality.

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