Topological **M**ethods in **N**onlinear **A**nalysis
Volume 67, No. 2, 2026, 409–441
DOI: 10.12775/TMNA.2025.030

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EXISTENCE OF MULTIPLE RADIAL SOLUTIONS FOR NONLINEAR EQUATION INVOLVING THE MEAN CURVATURE OPERATOR IN THE LORENTZ–MINKOWSKI SPACE

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Abstract. We prove the existence of multiple radial solutions for a class of nonlinear equations – involving the mean curvature operator in the Lorentz–Minkowski space – of the form

$$-\operatorname{div}\left(\frac{\nabla u}{\sqrt{1-|\nabla u|^2}}\right) = \lambda b(|x|)|u|^{q-2}u + f(|x|,u) \quad \text{in } B_R,$$

with Dirichlet boundary conditions in case $q \in (1,2)$ and $f(|x|,s)$ is superlinear in s. Solutions are found using Szulkin's critical point theory for non-smooth functionals. Multiplicity results are also given for some cases in which f depends also on (the norm of) the gradient of u.

2010 *Mathematics Subject Classification.* Primary: 35J20; Secondary: 58E05, 35J93, 35B07.

Key words and phrases. Mean curvature operator; radial solutions; concave-convex nonlinearity; variational methods; non-smooth functionals.

The third author is supported by the National Natural Science Foundation of China, No. 12571120.