

Nonlinear Elasticity: A new Lavrentiev phenomenon caused by impenetrability conditions

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Roughly speaking, if a functional exhibits an energy gap between its infima in its “natural” function space and a dense subspace of it, this is called a Lavrentiev phenomenon. The talk presents a new example of such a phenomenon in context of nonlinear elasticity, for a natural choice of the elastic energy functional. The energy gap in the example occurs between the Sobolev spaces $W^{1,p}$ and $W^{1,\infty}$ and is caused by an interplay of the elastic energy’s resistance to infinite compression and the Ciarlet–Nečas condition, a constraint preventing global interpenetration of matter on sets of full measure.

References

- [1] Stefano Almi, Stefan Krömer, Anastasia Molchanova, *A new example for the Lavrentiev phenomenon in Nonlinear Elasticity*, *Z. Angew. Math. Phys* 75 (2023)

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