

## Generic stress rectification in nonlinear elastic materials

Félix Benoist<sup>1</sup>, Guglielmo Saggiorato<sup>1</sup> & Martin Lenz<sup>1</sup>

LPTMS, CNRS, Univ. Paris-Sud, Université Paris-Saclay, 91405 Orsay, France  
[felix.benoist@lptms.u-psud.fr](mailto:felix.benoist@lptms.u-psud.fr)

Beyond their response to stresses applied at their boundaries, elastic materials also deform in response to internally exerted stresses. In living systems, such stresses typically originate from molecular motors embedded in a fibrous matrix, which rectifies internal force dipoles of any sign towards a biologically crucial isotropic contraction. Here we show that rectification is a more general effect, present in any nonlinear elastic material regardless of the geometry of the applied forces, which results in contraction or expansion depending on the material's nonlinearities.