Negative group velocity state in soft composites triggered via applied deformation

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Acoustic metamaterials allow us to access unusual properties that can be tailored through their microstructure design. Moreover, soft microstructured materials open the possibility to control and tune these properties through deformation [1,2]. Here, we reveal the existence of a state in soft composites – layered and 3D fiber composites, characterized by negative group velocity. Interestingly, the transition in the state from positive to negative group velocity is not accompanied by significant geometrical changes and can be reversibly controlled via applied deformation. We further discuss how this unusual state of negative group velocity can be induced and further tuned by variations in the material and geometric parameters.

References

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