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Mode Coupling of phonons in a Dense One-Dimensional Microfluidic Crystal JEAN-BAPTISTE FLEURY, Experimental Physics, Saarland University, 66123 Saarbrücken, Germany, ULF D. SCHILLER, Institute for Complex Systems, Forschungszentrum Jülich, 52425, Germany, SHASHI THUTUPALLI, Max Planck Institute for Dynamics and Self-Organization, 37077 Göttingen, Germany, GERHARD GOMPPER, Institute for Complex Systems, Forschungszentrum Jülich, 52425, Germany, RALF SEEMANN, Max Planck Institute for Dynamics and Self-Organization, 37077 Göttingen, Germany, FLEURY/THUTUPALLI/SEEMANN TEAM, SCHILLER/GOMPPER TEAM — Microfluidic crystals are highly ordered arrangements of water-in-oil droplets flowing in microchannels. Their collective dynamics can exhibit a rich behaviour due to the long-range hydrodynamic interactions mediated by the surrounding phase. In this work, we report the specific excitation of long-lived phonon modes in a dense microfluidic crystal. The excited vibrations show transverse modes that originate from the dipolar flow field around the droplet, whereas the longitudinal modes arise from a non-linear coupling due to the breaking of translational invariance under confinement.

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