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Wave Propagation in Origami-inspired Foldable Metamaterials PAI WANG, SIJIE SUN, Harvard University, KATIA BERTOLDI, bertoldi@seas.harvard.edu — We study the propagation of elastic waves in foldable thin-plate structures. Both 1D systems of periodic folds and 2D Miura-Ori patterns are investigated. The dispersion relations are calculated by finite element simulations on the unit cell of spatial periodicity. Experimental efforts and considerations are also discussed. The characteristic propagating bands and bandgaps are found to be very sensitive to the folding angles. The existence of highly tunable bandgap makes the system suitable for potential applications including adaptive filters in vibration-reduction devices, wave guides and acoustic imaging equipment.

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