Acoustic Metamaterials Tunable Gradient Index Phononic Crystals For Acoustic Wave Manipulation
The novel opens with Aunt Polly scouring the house in search of her nephew, Tom Sawyer. She finds him in the closet, discovers that his hands are covered with jam, and prepares to give him a whipping. Tom cries out theatrically. "Look behind you!" and when Aunt Polly turns, Tom escapes over the fence. After Tom is gone, Aunt Polly reflects sadly on Tom's mischief and how she lets him get away with too much.

Tom comes home at suppertime. It is a well-known fact that Tom cannot be skipped school that afternoon and even worse that his collar is still wrung out.

Tom and the new arrival enter the parlor. Tom has sworn to his aunt that he is not a whistling boy. While wandering the streets of St. Petersburg, Tom and Huckleberry Finn meet Mr. Toms, his half brother.

When he returns home in the evening, Tom finds Aunt Polly waiting for him. She notices his dirty clothes and resolves to make him work the next day, a Saturday, as punishment.

On Saturday morning, Aunt Polly sends Tom out to whitewash the fence. Jim passes by, and Tom tries to get him to do some of the whitewashing for a "white alley," a kind of undercoat. Jim almost agrees, but Aunt Polly appears and chases him off, leaving Tom alone with his tasks.
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Acoustic Metamaterials Tunable Gradient Index Phononic Crystals for Acoustic Wave Manipulation

by Sz-Chin Steven Lin

Acoustic metamaterials are of growing interest due to their ability to manipulate the propagation of acoustic waves in an extraordinary manner to benefit various applications, such as communications, biosensing, and medical diagnosis and therapy.

For instance, electromagnetic (EM) wave gradient index metamaterials (GIMs) have been theoretically and experimentally demonstrated for nearly perfect conversion of propagating waves to SWs. It is further shown that such a wave mode conversion can be utilized for unidirectional transmission. As the counterpart of EM waves, it is expected that acoustic waves can also be manipulated in a similar fashion.

Asymmetric transmission of acoustic waves in a waveguide with flexural wave propagation and compression in one type of high stiffness-gradient-index metamaterial constructed with an elastic beam with an array of the piezoelectric sensors with gradient shunting circuits.

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