

Letters to the Editor

Acoustics Today welcomes “Letters to the Editor.” Letters (maximum 150 words) can be on any topic related to acoustics or any comments on material in recent issues of *Acoustics Today*. Letters will be published on a space-available basis. Letters should be sent to apopper@umd.edu.

The Least Useful Equation in Acoustics?

It is always disconcerting to see the inflated importance that acousticians assign to the wave equation, as well as their failure to comprehend its meaning. Dr. Eastland’s fine article in the Spring 2021 issue of *Acoustics Today* (<https://bit.ly/3ukKcKK>) provides a clear example of this problem. He correctly states that “The [wave] equation relates the temporal and spatial changes to these variables,” but the previous sentence incorrectly claims that the “[wave] equation provides the mathematical relationships between the variables of interest in acoustics, often the acoustic pressure or particle velocity and the speed of the wave.”

Three first-order differential equations that determine “the mathematical relationships between the variables of interest.” Pressure and density are related by the equation of state, pressure and velocity are related by the momentum equation (e.g., the non-dissipative Euler equation), and density and velocity are related by the continuity equation. That content of those *local* relations is obliterated when they are combined to form the *global* second-order wave equation.

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The article Computational Methods and Techniques Across Acoustics by G. C. Eastland in the Spring 2021 issue of *Acoustics Today* (<https://bit.ly/3ukKcKK>) talked about the role of computers in acoustics. Analysis concepts based on energy principles developed by W. P. Mason might also be added to the list due to their importance in entire industries, including the entire sound reproduction industry, every ultrasonic device employing piezo electric material, and every active or passive sonar

device. The technique allowed a designer to re-configure an acoustic device into an electrical circuit analogue and from there develop its acoustic and electrical properties.

Dr. Mason was the president of the Acoustical Society of America (ASA) in 1956, was an ASA Gold Medalist, and the author or co-author of numerous publications.

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