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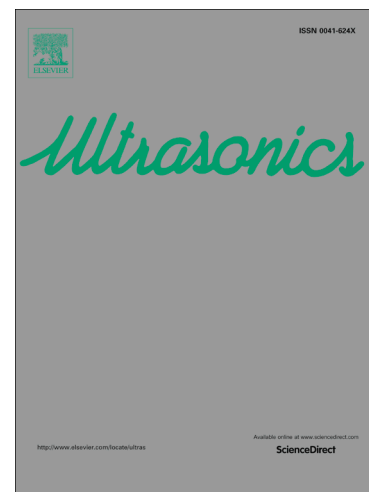
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# Ultrasonic backscatter from elongated grains using line focused ultrasound

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## Abstract

Ultrasonic backscattering from polycrystalline materials with elongated grains is investigated. A normal incident line-focus transducer is employed such that refracted longitudinal and transverse waves are focused within the polycrystal and scatter at grain boundaries back to the transducer. A ray-based scattering model is developed to explain the dependence of the statistics of scattering measurements on grain elongation. The spatial variance of measured scattered signals from Al alloy (7475-T7) is compared to the model. This work promotes the ultrasonic backscatter technique for monitoring grain elongation of metals using a single transducer with access to a single sample face.

*Keywords:* Backscatter, Scattering, Attenuation, Grain Elongation, Grain Size

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