

Abstract Submitted  
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**Analysis of recent observations of ultrasound propagation in solid  $^4\text{He}$**  HARRY KOJIMA, Rutgers University, IZUMI IWASA, Kanagawa University, JOHN GOODKIND, UCSD — Extensive measurements have been made on the propagation of 10 MHz ultrasound in solid  $^4\text{He}$ . When the sound excitation level is low, sudden shifts in both the sound propagation velocity and attenuation are observed below 100 mK but the sudden shifts disappear when the excitation level is sufficiently high. The detailed response depends on the ultrasound excitation level and thermal history. The observations are analyzed in terms of the Granato-Lücke theory on the effects of dislocation line motion on the propagation of sound. The effects of pinning of dislocation lines by  $^3\text{He}$  impurities are included in the analysis. Parameters such as the average dislocation length, the dislocation line density, the dissipation coefficient and the impurity binding energy that are extracted by fitting the data to theory will be discussed.

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