## عنوان مقاله:

Numerical modeling of the propagation of ultrasonic waves in AISI ۳۱۶L welds made by SMAW and GTAW processes

## محل انتشار:

دوفصلنامه مبانی نظری و کاربردی علم آکوستیک و ارتعاشات, دوره 6, شماره 1 (سال: 1399)

تعداد صفحات اصل مقاله: 12

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## خلاصه مقاله:

Ultrasonic evaluation of austenitic welds has long been considered to be difficult. Recent studies in this field have made it possible to inspect these welds in many cases. However, the ultrasonic inspection methods of austenitic steels are more complicated and limited than those of ferrite steels. The difficulty in ultrasonic testing of austenitic welds stems from the presence of anisotropic and expanded grains, which are usually in the form of columnar structures. These grain structures lead to local anisotropy in these types of welds. This paper aims to create a more thorough understanding of the propagation of ultrasonic waves in austenitic welds produced by gas tungsten arc welding and shielded metal arc welding processes. For this purpose, special finite element models are developed for these two types of welds. In these finite element models, the orientation of the structural domains in welds is accounted for in both SMAW and GTAW processes. Results are validated by comparison of the numerical models with theoretical predictions and experiments already reported in the literature. The numerical models provide a better understanding of how ultrasonic waves propagate in anisotropic structures of SMAW and GTAW welds

## کلمات کلیدی:

Ultrasonic technique, Austenitic weld, FE simulation, SMAW, GTAW