

Abstract Submitted
for the APR16 Meeting of
The American Physical Society

Pressure Sensitive Acoustic Ring Resonance in Nuclear Fuel Rods

JOHN DOOLEY, Retired — A four-antinode acoustic resonance that is sensitive to internal helium pressure has been observed in nuclear fuel cladding containing a helical plenum spring. Sound is generated by an external piezoelectric transducer pressed against the wall. Sound is detected by a similar transducer located 90 degrees away from the generator transducer. The resonance amplitude is characterized by its response to pressure (0-4atm), temperature (16C-27C) and molecular weight (He and Ar). The resonant frequency and the temperature dependence agree qualitatively with predictions made by assuming that the resonance is an acoustic version of the Sagnac interferometer. The resonance amplitude at 4 atm absolute is approximately 4 times the amplitude at 1 atm absolute. The pressure sensitivity could be useful for quality control of newly assembled nuclear fuel rods.

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Date submitted: 10 Dec 2015

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