

MEASUREMENTS OF SEISMIC WAVE ATTENUATION IN BUBBLY LIQUIDS: THE WIGED MECHANISM

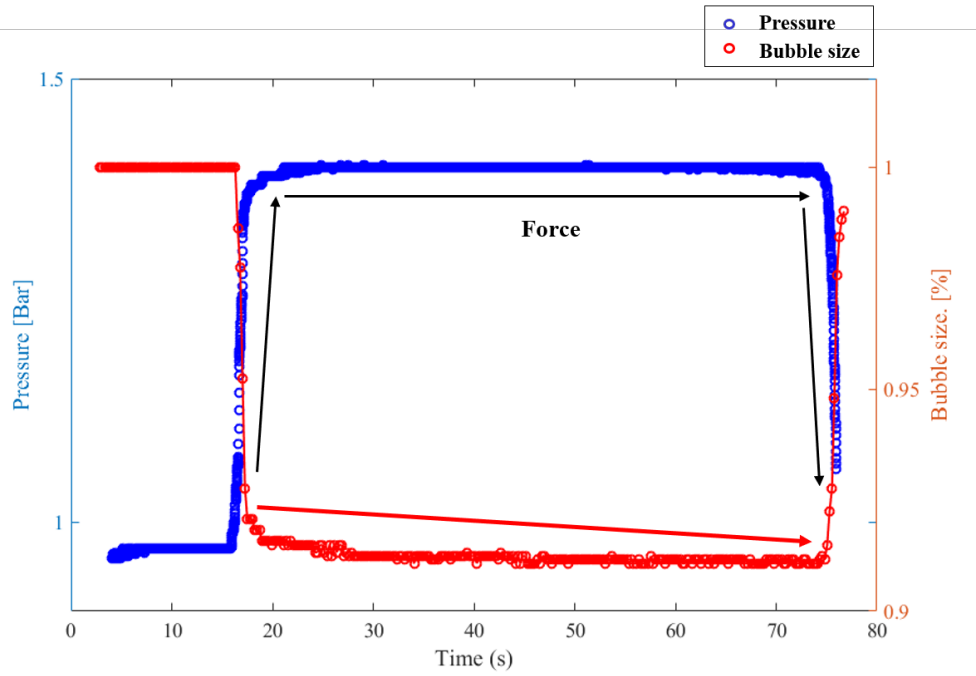
Ziqi Jin^{1,2}, Nicola Tisato² and Omar Alamoudi²

1. Northeast Petroleum University, China

2. The University of Texas at Austin

ABSTRACT

Rocks that are saturated with bubbly liquids could exhibit seismic wave attenuation due to the Wave-Induced Gas Exsolution Dissolution (WIGED) mechanism. We designed and performed laboratory and numerical experiments to measure attenuation in water containing air bubbles. We built, calibrated, and performed laboratory experiments with an apparatus that allows observing gas bubbles undergoing deformation as a function of the fluid pressure. Then, we successfully modeled the data with the WIGED theory. Our results help to show that WIGED can cause attenuation at seismic frequencies.



Change of the bubble size as a function of the change of pressure. The initial pressure is 0.9 bar and it increase up to the target pressure of 1.4 bar. After 20 sec, the bubble keep shrinking due to the WIGED effect.