

Hohai University, Nanjing, China

February 20, 2019

Dear GJI Editor

Enclosed you find our manuscript *Effect of capillarity and relative permeability on Q anisotropy of hydrocarbon source rocks*, by Santos et al., to be considered for publication in Geophysical Journal International.

We have carefully checked the bibliography on mesoscopic attenuation and Q anisotropy in source and reservoir rocks, without finding any paper treating the case of multiphase fluids. The model we are using, published in JASA in 1990, was developed based on first principles and since its publication, no papers pointing out failures in the arguments have appeared. Many papers in the area of applied geophysics do not consider multiphase saturant fluids, which is a familiar subject in oil reservoir simulation. Instead, some publications analyze the cases of segregated or effective single-phase fluids, or use ad-hoc models that artificially introduce membranes to represent capillary effects. These publications do not consider the theoretical basis of two-phase fluid flow that include capillary pressure and relative permeability functions to model the interaction between the two fluids as they move within the pore space. Furthermore, Q anisotropy in shale oil-gas reservoirs (two fluids assuming surface tension) has not been considered yet. The published papers only analyze velocity anisotropy or a single-phase effective fluid. The results presented in this work are quite different if compared to the

case of a single-phase effective fluid , as shown in the paper.

Sincerely,

Prof. Jing Ba, corresponding
author