Tagir Farkhutdinov* (farkhutd@ualberta.ca), Vakhtang Putkaradze (putkarad@ualberta.ca) and François Gay-Balmaz (francois.gay-balmaz@lmd.ens.fr). Variational Methods for the Dynamics of Porous Media.

We use the variational approach to derive the equations of motion of compressible homogeneous elastic porous media filled with ideal incompressible fluid. We introduce a new quantity, the pore volume \( v(x, t) \) that affects the local potential energy of solid and relates to its porosity. For the derived system, the total energy density equation computed in the form of a conservation law. The linearization of equations is investigated to confirm the stability of wave propagation. Phase and group velocities of \( s- \) and \( p- \) waves and corresponding attenuation coefficients were computed numerically for non-dimensional parameter sets. We compared our linearized system with the equations of porous mechanics from Biot’s 1962 paper and found partial correspondence, relating our parameters with Biot’s phenomenological coefficients. (Received January 29, 2019)