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Chadia Affane Aji* (affane@tuskegee.edu), 2360 Springwood Dr, Auburn, AL 36830, and **A. J. Meir**. *Poroelasticity*.

Poroelasticity is the study of elastic deforming porous materials saturated with a fluid causing a coupling between the fluid pressure and the solid deformation.

This work describes the quasi-static poroelasticity system of partial differential equations consisting of the equilibrium equation for momentum conservation and the diffusion equation for Darcy flow. Using a constructive approach (Rothe's method of lines), we prove the existence and uniqueness of weak solutions to the equations of the quasi-static poroelasticity system. Moreover, numerical methods for solving the poroelasticity system are developed. (Received August 18, 2008)