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Dambaru Bhatta* (bhattad@utpa.edu). *Three dimensional hydro-thermal convective flow in an aquifer system.* Preliminary report.

Abstract Here we consider a three dimensional hydro-thermal convective flow in an aquifer system. We assume that the aquifer is heated from below, and it is bounded below and above by impermeable boundaries. The partial differential equations governing the system are conservation of mass, conservation of heat and momentum equation governed by the Darcy's law. Using basic state solutions and the critical pair of Rayleigh number and wavenumber, the linear and adjoint systems for three dimensional case are obtained. Then we derive the Landau equation for the amplitude of this flow. Analytical expression as well as numerical values for the Landau constant are presented. (Received September 08, 2013)