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Longhua Zhao* (lxz315@case.edu) and **Maria-Carme Calderer**. *Phase transitions in gels with two-phase model*. Preliminary report.

Due to the physical complexity of gels and lack of fully understanding, numerous challenges arise in developing accurate mathematical models of dynamical gel behavior. We build a regularized two-phase model for gels to handle the ill-posedness for the problem. To demonstrate the property of the problem, we consider the gel in one dimension and analytically explore the periodic solution for 1D problem. With special initial conditions, there exist traveling wave solutions. These results can be applied to investigate the volume phase transition in gels. (Received July 24, 2013)