

We study nonlinear evolutionary partial differential equations that can be viewed as a generalization of the heat equation where the temperature gradient is bounded but the heat flux is a priori only a measure. We consider this system in a spatially periodic setting and use higher differentiability techniques to prove the existence and uniqueness of a weak solution with integrable heat-flux for all values of the material parameter a . Under some more restrictive assumptions on a , we prove higher integrability of the heat flux.