Vanishing viscosity method for a noncoercive hyperbolic differential hemivariational inequality

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Abstract: We consider a coupled system consisted of a second order hemivariational inequality (HVI) and an ordinary differential equation (ODE). Our goal is to provide an existence of a solution for the above problem. It has been done recently in [1] by means of the Rothe method. Now we apply an alternative technique based on a vanishing viscosity method. The idea comes from [2], where the vanishing viscosity method was used in the study of hyperbolic HVI without additional ODE. We also discuss applications of the theoretical result in contact problems and formulate some open questions.

References

[1] Z.J. Peng, S. Huang, C.M. Ma, *Noncoercive hyperbolic variational-hemivariational inequalities with an application to contact problem*, Nonlinear Anal. Real World Appl. 73 (2023), 103871.

[2] S. Migorski, A. Ochal, *Vanishing viscosity for hemivariational inequalities modeling dynamic problems in elasticity*, Nonlinear Analysis 66 (2007) 1840–1852.