A TRIAL OF UNIFICATION IN CONTACT MECHANICS WHICH LEADS TO DIFFERENTIAL INCLUSION

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We present a general method to study viscoelastic contact problems with the Kelvin-Voigt constitutive law and subdifferential boundary conditions. We treat evolution hemivariational inequalities which are weak formulations of contact problems. Our approach allows to unify several methods for models considered in contact mechanics. We establish the existence of solutions to hemivariational inequalities with different types of nonmonotone multivalued boundary relations. These results are consequences of an existence theorem for second order evolution inclusions. Finally we provide applications to several unilateral and/or bilateral problems in contact mechanics.