ON APPLICATIONS AND COMPUTATIONAL RESULTS FOR A NEWLY DEVELOPED THERMODYNAMICALLY COMPATIBLE VISCOELASTIC MODEL

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Abstract

We present a new thermodynamically compatible incompressible rate type fluid model (a non-linear version of the Oldroyd model) that is capable of capturing the experimental data for viscoelastic asphalt binder. Using this model, we performed several computer simulations in time-varying domains. In particular, for a problem of rotating viscoelastic square, we show how important is the choice of the appropriate time-discretization scheme. The first order unconditionally stable backward Euler scheme is compared with almost the third order conditionally stable Glowinski time-discretization scheme.