General decay properties of abstract linear viscoelasticity

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We discuss the stability of a linear Volterra integro-differential equation of hyperbolic type, which can be viewed as an abstract version of the equation

$$\partial_{tt} u(t) - \Delta u(t) + \int_0^t \mu(s) \Delta u(t - s) ds = 0$$

describing the motion of linearly viscoelastic solids. We establish new relations between the decay rate of the solutions and the behaviour of the convolution kernel $\mu$ at infinity, for a much larger class of kernels than the one considered in the literature. This is a joint project with V. Pata.