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Mickael D. Chekroun, Francesco Di Plinio* (fradipli@indiana.edu), **Nathan E. Glatt-Holtz** and **Vittorino Pata**. *Regularization properties and asymptotics of the Coleman-Gurtin model.*

Models with extra terms accounting for hereditary memory have become prominent in both theories of viscoelasticity (for example, Kelvin-Voigt viscoelastic law) and of heat conduction (Coleman-Gurtin heat law). Due to the intrinsic "hyperbolic" nature of the memory term, complete finite-time smoothing is not generally possible for these systems. However, in some cases where the corresponding system without memory has regularizing properties, a partial smoothing of the non-memory part of the equation can be obtained. Working in the history space setting, this property is then used to construct global and exponential attractors of optimal regularity and finite fractal dimension for the differential system arising from the Coleman-Gurtin model. (Received August 23, 2009)