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The End of Aging in a Spin Glass GREGORY KENNING, Department of Physics, Indiana University of Pennsylvania, GILBERTO RODRIGUEZ, Department of Physics, University of California Riverside, RAYMOND ORBACH, Department of Energy, Office of Science — Aging phenomena in complex systems has been used as an important tool to investigate the physics of complexity. In particular aging effects in spin glasses, measured using the Thermoremenant Magnetization (TRM) decays, have been instrumental as a probe of complex equilibrium and non-equilibrium dynamics. Current theoretical and experimental analysis suggest that the TRM decay of spin glasses is mainly composed of two terms; The "stationary" term which does not depend on the sample history and dominates the short time decay (<1s) and a long time aging term which depends on the samples history. We report finding that aging found in spin glass materials, has a finite lifetime and that after aging has ended there is a third component of the magnetization decay. This decay is independent of the waiting time, logarithmic in nature and part of the same mechanism that produces aging. Finally we find that the logarithmic decay implies a maximum aging time (MAT) that is very strongly dependent on temperature and ranges from short times near the spin glass transition temperature to many times the current best estimates of the age of the universe for low temperature.

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