Jon Calhoun
**Understanding the Propagation of Silent Data Corruption
in Algebraic Multigrid**

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Sparse linear solvers from a fundamental kernel in high performance comput-
ing (HPC). Exascale systems are expected to be more complex than systems of
today being composed of thousands of heterogeneous processing elements that
operate at near-threshold-voltage to meet power constraints. The combination
of near near-threshold-voltage and number of processing elements required to
reach exascale increases the rate of silent data corruption (SDC). With the rate
of SDC expected to be higher, understanding how error propagates in HPC
applications becomes vital to devise efficient detection and recovery schemes.
In this talk, we investigate how SDC occurring in fixed-point and floating-
point instructions propagates in the linear solver algebraic multigrid (AMG).
We discover that SDC occurring on the coarsest levels have the most impact on
convergence requiring extra iterations in a higher percentage than on the finest
levels.