Green Flash: A power efficient computer for global cloud system resolving models

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The sustained computational rate to integrate Global Cloud System Resolving Models (GCSRM) for century scale simulations will exceed 10 petaflops. Incorporation of machine efficiency leads to estimates of peak computer speeds of several exaflops to construct ensembles of these calculations. Extrapolation of traditional supercomputer designs is prohibitive both from cost and power considerations. We present an alternative approach based on tailoring a machine specific to GCSRM integration. Such a fully programmable machine based on the same design technology used in portable consumer electronics such as cell phones and music devices would be considerably less expensive to procure, use much less power and be more efficient that traditional multi-purpose supercomputers. We present a strawman machine design, based on today’s technology, to integrate a 2km version of the Colorado State University GCSRM one thousand times faster than real time.