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**Evanescent data segmental refinement multigrid: ideas  
and experiments**

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We introduce a modified approach to evanescent data segmental refinement (SR), based on Achi Brandt's work on low-memory multi-level techniques (1977). Evanescent data SR avoids storing the entire finest grid(s) at any time during the computation and thereby drastically reduces the memory complexity of a standard full multigrid (FMG) full approximation scheme solver. Naturally, this feature also provides a way to compress an accurate fine-grid solution to a coarser grid and reproduce the fine-grid solution later. We discuss a simple one-level evanescent data scheme as well as approaches to a multi-level version; both can be applied within a sequential SR solver or as part of a parallel one. We present preliminary experimental results of a model problem for two FMG SR solvers: a vertex-centered finite difference solver and a cell-centered finite volume solver. We discuss the trade-off between storage requirements and computational complexity.