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- **Title:** Efficient parallel stencil computations in Accelerate
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Stencil codes are a type of array computation, where the computation at each element of the array makes use of the surrounding array elements in a fixed pattern, know as the stencil. These types of codes are commonly found in scientific and engineering applications, such as computational fluid-dynamics, image processing, and the solution of partial differential equations.

Although stencil computations often have a succinct, declarative definition, deriving an efficient implementation from such high-level definitions can be challenging.

In this work, we assess several techniques to implementing efficient stencil computations, including parallelisation, vectorisation, tiling, and halo regions. We implement our work in the embedded language Accelerate, and achieve performance equivalent to—and sometimes exceeding!—hand-tuned implementations.