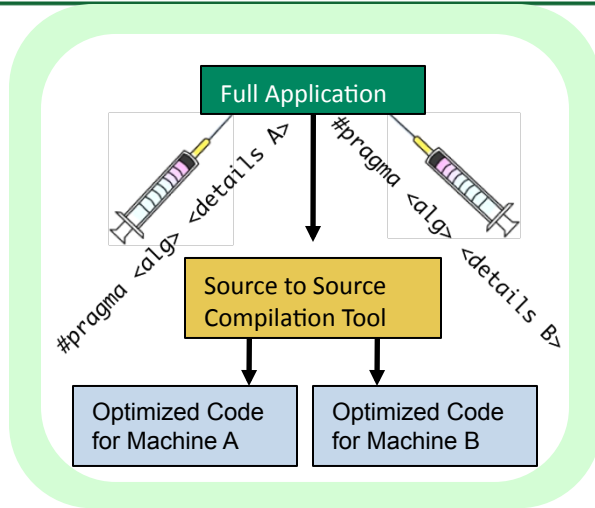# SAIMI: Separating Algorithm and Implementation via Programming Model Injection

Novel Ideas

• Injection of implementation details through the use of pragmas and library abstractions.

- • semi-automating look-up table optimization
- • separating grids with complex periodic boundaries from the operators over the grid (GridWeaver)
- • providing library support for sparse tiling

• Incrementally raise the abstraction level for implementation details.

• Investigate the composition of injected programming models.

Impact and Champions

• The SAIMI project aims to develop abstractions that enable the orthogonal specification of algorithms and implementation details within the context of existing DOE applications.

• Injectable programming models enable the expression of the most computationally intense and communication heavy portions in many scientific simulations.

• This approach will bring compiler technology to bear in an incremental fashion thus easing performance programming efforts.

PI: Michelle Strout, Colorado State University

Milestones/Dates/Status

	Scheduled	Actual
• Developing eval criteria	DEC 2010	JUN 2010
• CGPOP miniapp	JUN 2011	JUN 2011
• LUT optimization tool	DEC 2011	DEC 2011
• Gridweaver prototype for update halo and stencil computations	JUN 2012	JUL 2012
• Sparse tiling run-time library	DEC 2012	
• GridWeaver code generator	JUN 2013	
• Pragma support for sparse tiling	DEC 2013	
• GridWeaver optimizations	JUN 2014	
• Prototype composed injectable programming models	MAR 2015	

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