

ECE GSA Student Paper Competition

Brian MacKie-Mason

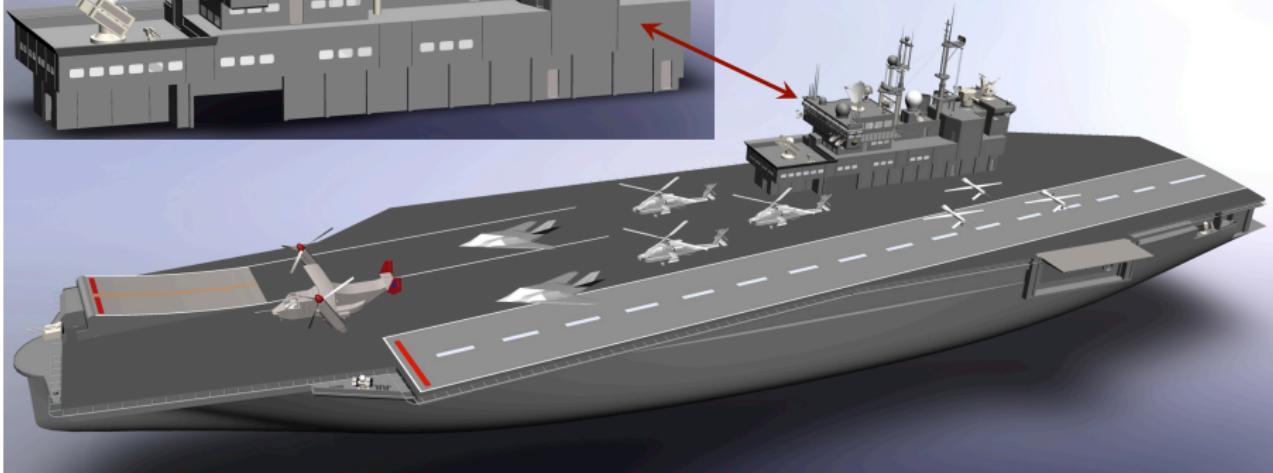
Apr. 8, 2016

Brian MacKie-Mason, Andrew Greenwood, Zhen Peng, "Adaptive and parallel surface integral equation solvers for very large-scale electromagnetic modeling and simulation (invited paper)," *Progress in Electromagnetics Research*, vol. 154, pp. 143–162, 2015.

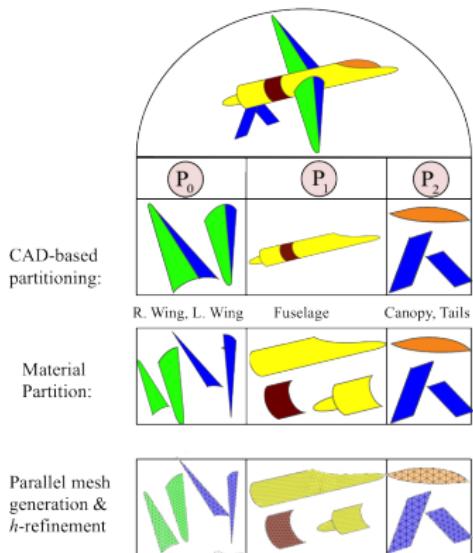
Complex Integrated Island



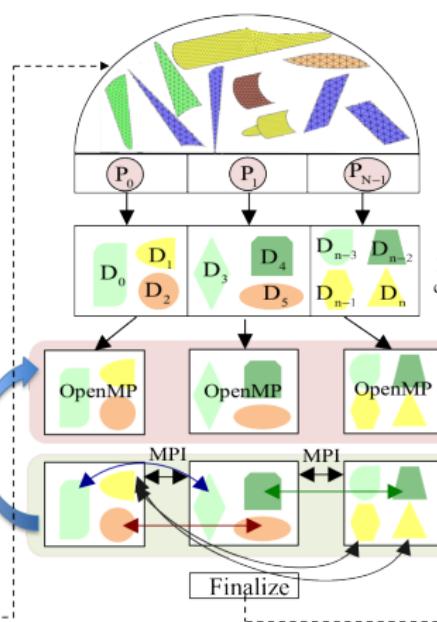
Frequency	Carrier Length	Mesh Points
12 MHz	10λ	> 20,000
120 MHz	100λ	$\approx 2,000,000$
1.2 GHz	$1,000 \lambda$	$\approx 200,000,000$
12 GHz	$10,000 \lambda$	$\approx 20,000,000,000$



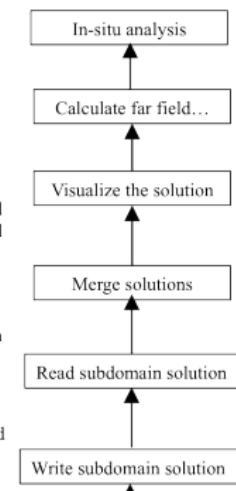
Pre-processing

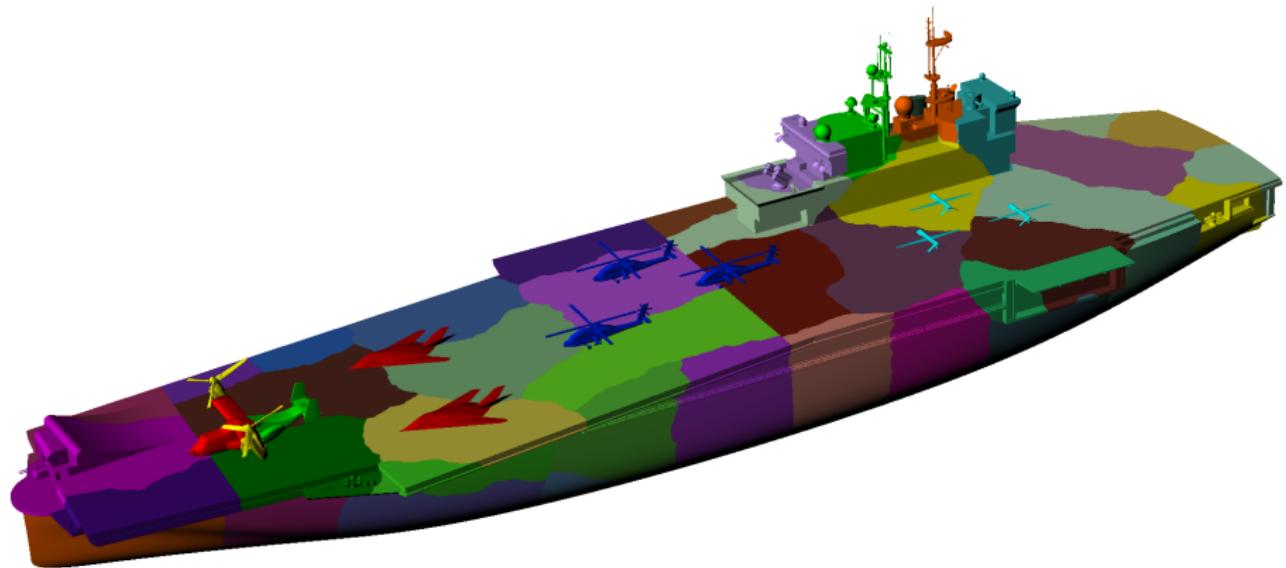


Computation



Post-processing





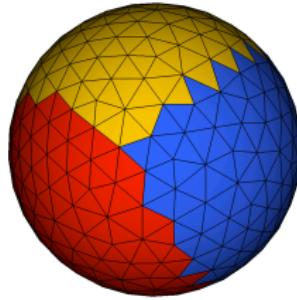


Figure: Domain partitioning, $N=3$

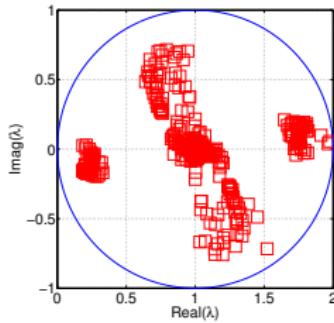
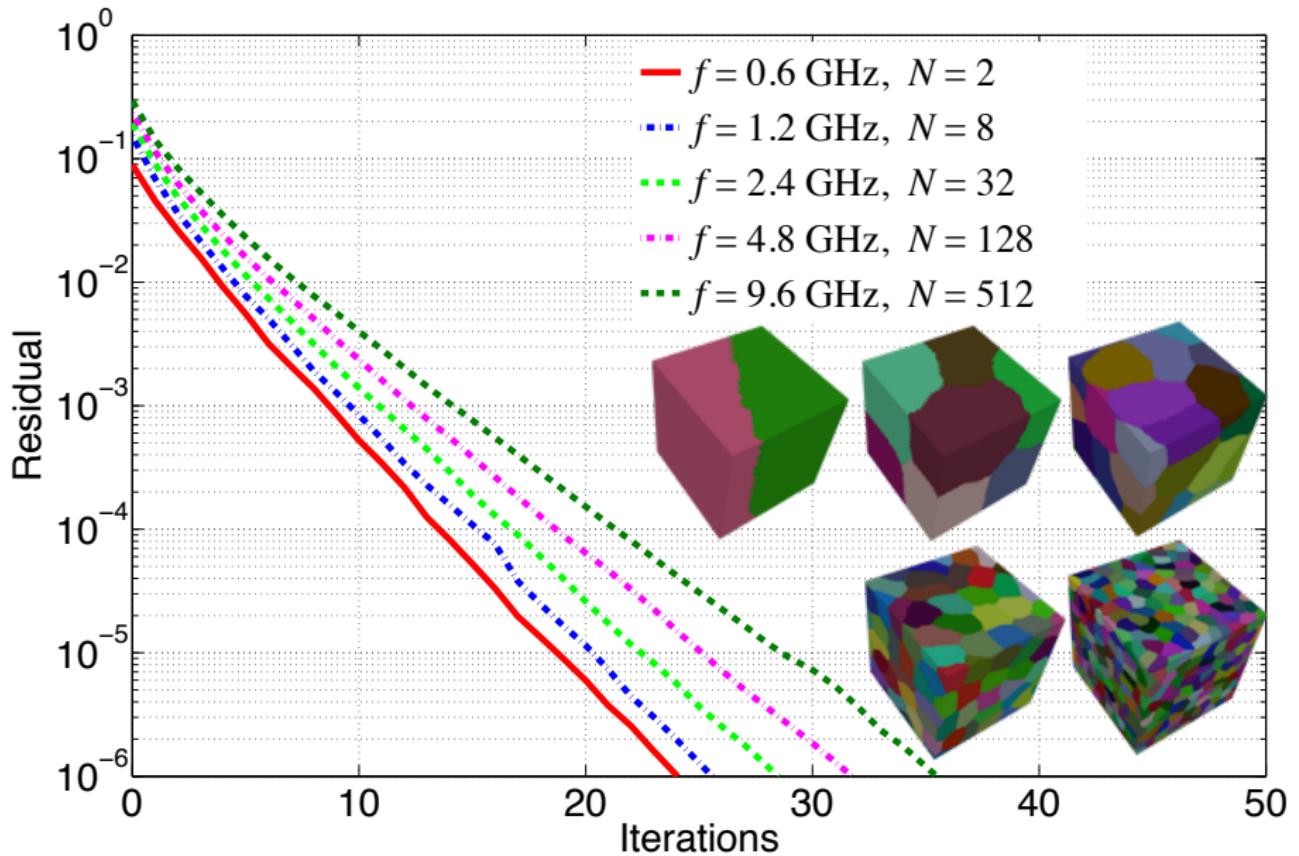
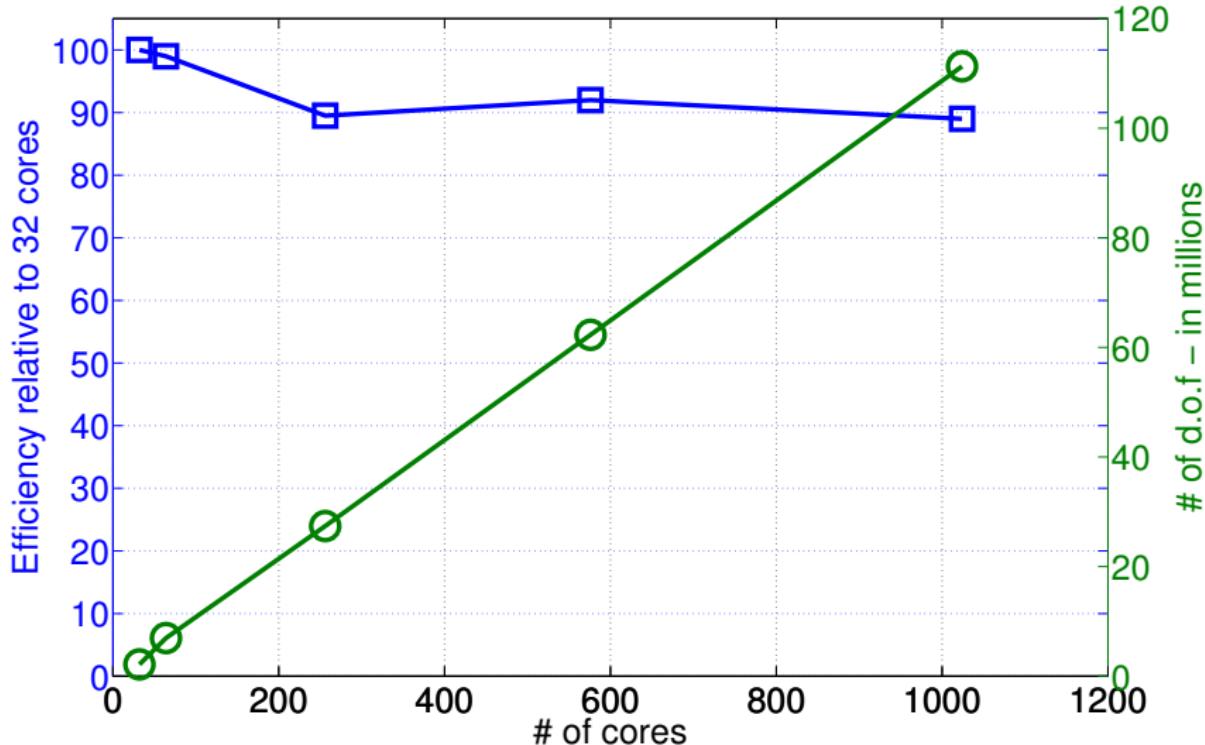
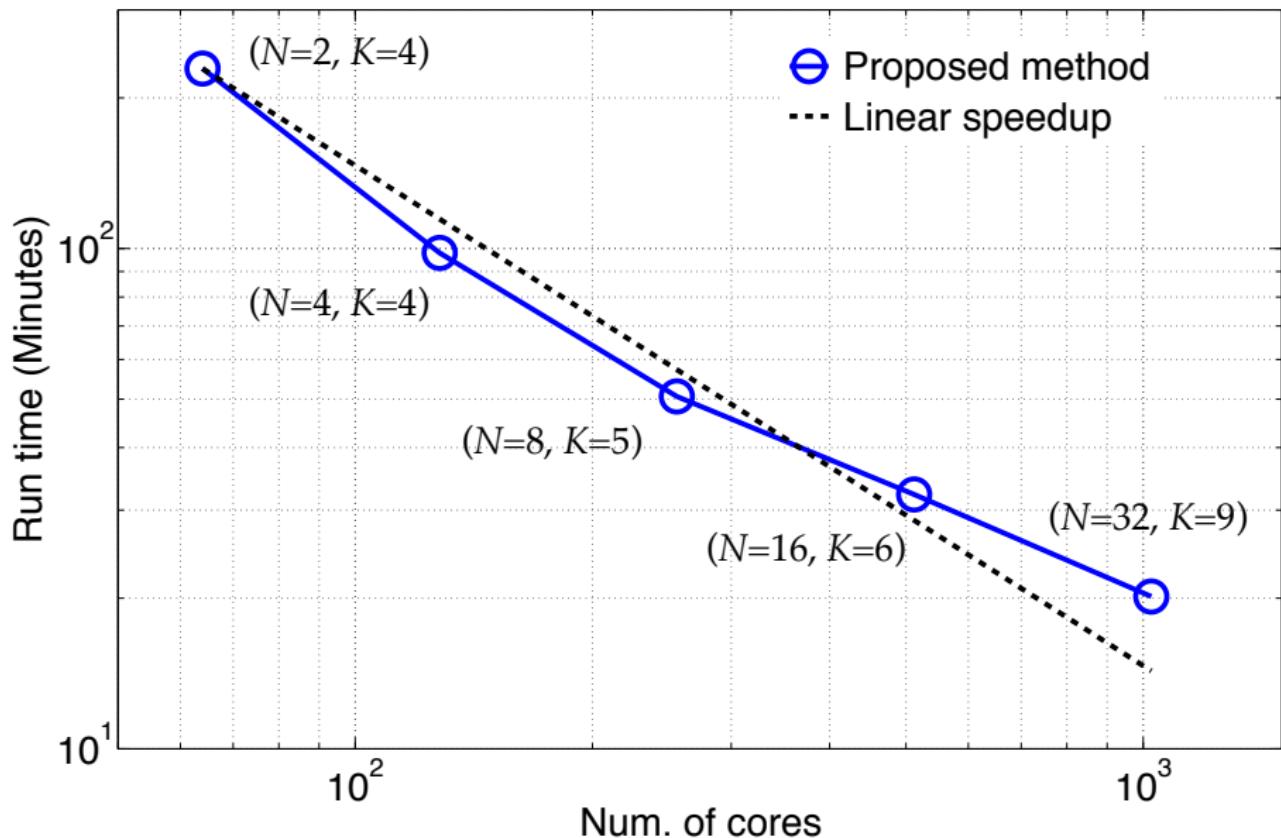


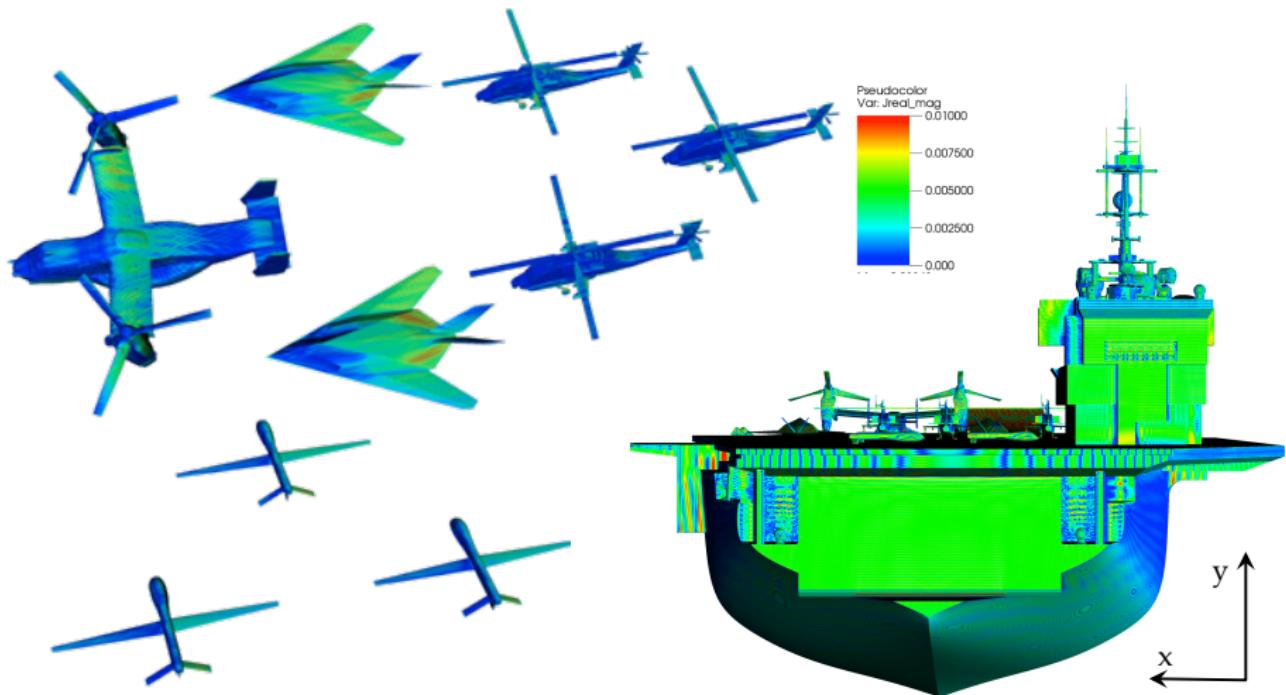
Figure: Eigenspectrum, $f=240\text{MHz}$



$$\eta = \frac{N \cdot t_1}{t_N}$$







Thank you!

