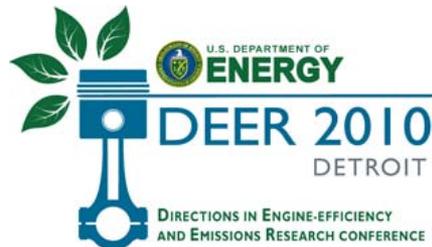
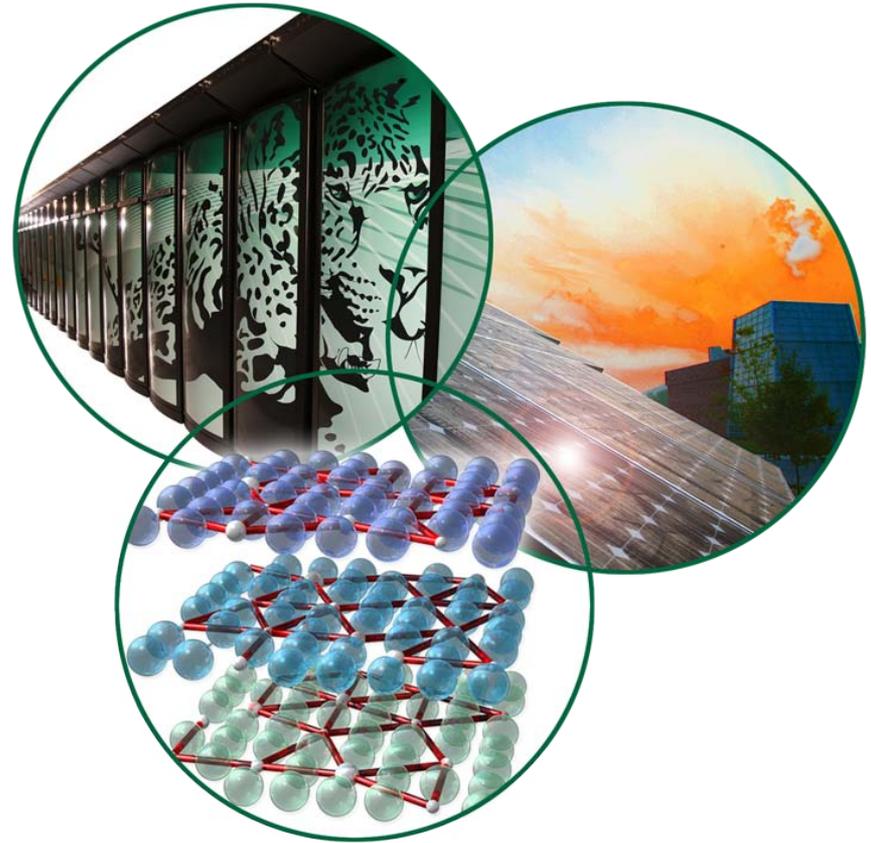


Evaluation of Variable Compression Ratio on Engine Efficiency

Jim Szybist

September 29, 2010

Poster Location: P-16

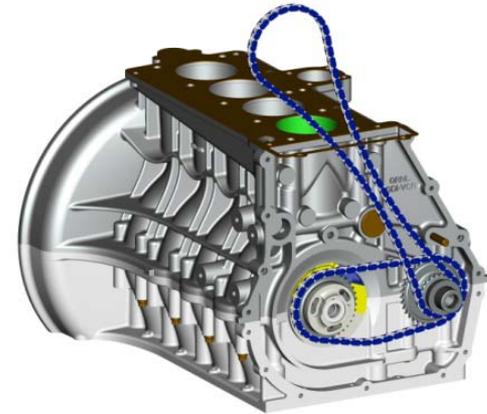


Background

- Higher compression ratio (CR) can result in higher engine efficiency
- Practical constraints, such as knock, limit CR
- Since knock is less problematic at part-load conditions, there is a potential efficiency benefit for a variable CR engine

Prototype variable CR research engine

- Engine designed and built by Envera, LLC
- Custom block with eccentric VCR mechanism
- Production DI cylinder head



Methodology

- Perform parametric sweeps of fuel injection timing, fuel injection pressure, and cam timing
- Experimental studies will populate an experimental database of engine operation
- Results will be used as input to drive-cycle simulation software to provide potential real-world fuel economy benefits of variable CR technology