

Abstract Submitted  
for the OSS14 Meeting of  
The American Physical Society

**Genetic Algorithm optimization of wind turbine shrouds** VANCE  
TURNEWITSCH, CAVENDISH MCKAY, Marietta College — The efficiency of  
Horizontal Axis Wind Turbines (HAWTs) can be improved by surrounding the tur-  
bine with a shroud. Both computational and experimental studies have shown that  
turbines with shrouds can exceed the theoretical Betz power conversion limit. We  
make use of a genetic algorithm to find optimal shroud shapes subject to constraints  
related to shroud size. The efficiency of the turbine-shroud system is measured via  
finite element simulations (using the Code-Saturne CFD package), with shroud ge-  
ometries and meshes generated programmatically. We conduct full 3D simulations,  
but use the Actuator Disk theory model to simplify the computations.

Cavendish McKay  
Marietta College

Date submitted: 19 Mar 2014

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