

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Statistics preserving formation of chaotic swarms**<sup>1</sup> IULIANA OPREA, Colorado State University, IOANA TRIANDAF, IRA SCHWARTZ, Naval Research Laboratory — We present a class of models for self-propelled multi-agent systems of autonomous vehicles that accomplish common tasks while preserving the formation moments of inertia. The models are based on simple, local interaction rules that create prescribed overall complex patterns in which coupling and communication are key elements. We use a statistics-preserving algorithm with a Duffing-like term added to the equations of motion to control the moments of the pattern formation. We concentrate on those parameters in the neighborhood of a resonant situation. This allows us to obtain interesting patterns of behavior similar to those observed in parametrically forced systems near resonance.

<sup>1</sup>Work supported by the Office of Naval Research.

Iuliana Oprea  
Colorado State University

Date submitted: 26 Nov 2007

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