1067-R1-237   **Chris Arney*** (`david.arney@usma.edu`), Dept of Math, USMA, West Point, NY 10996.
Mathematical Modeling of "hearts and minds" in the Terrorism/Counter-Terrorism Struggle.

Students in differential equations courses should see and experience the complexity of real applications and their utility in society. An interesting and accessible, real and relevant, military-political application with many complex interactions is the struggle between terrorism (T) and counter-terrorism (CT). We model the T-CT struggle with a large system of first-order differential equations that includes factors such as leadership, promotion, recruitment, resources, operational techniques, cooperation, intelligence, science, and psychology taken from policies and procedures found in terrorism and counter-terrorism manuals. We share our experience of teaching this large systems of differential equations using this modeling-first approach. We see from our analysis that it is easy to confirm what we see in the news – in insurgencies, asymmetric warfare (terrorism) wreaks havoc upon the less flexible force. For military forces to be effective against terrorism, the mathematics shows they must possess flexibility. The presentation provides a student view of confronting complexity in modeling and solving and analyzing large systems. (Received August 11, 2010)