The Hunt for Red October II: a demonstration for introductory electromagnetism DANIEL ZILE, THOMAS SEBASTIAN, VIKTOR POLYAK, Towson University, ANJALEE RUTAH, Bryn Mawr School, JAMES OVERDUIN, Towson University — We have designed, constructed and tested a small-scale version of the silent submarine depicted in the 1990 Sean Connery thriller *The Hunt for Red October*. This vessel contains no moving parts. It uses onboard batteries and magnets to propel seawater salt ions out of the back of the boat, producing an equal and opposite forward thrust on the submarine thanks to Newton's third law. Such a craft could be very hard to detect by conventional means. Our objectives were to create a striking teaching demonstration for introductory electromagnetism courses and to determine why (to our knowledge) no navy has yet exploited such a seemingly revolutionary propulsion system for purposes of national defense. As teaching demonstrations, our prototypes are very successful at capturing student interest and convincing them of the reality and practical importance of electromagnetic fields. We have also identified a number of factors that may help to explain why a scaled-up model might not quite function as depicted in the film. We discuss several promising avenues for future student research.

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