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**The Retarding Force on a Fan-Cart Reversing Direction**<sup>1</sup> TAR-  
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In introductory physics, students learn that an object tossed upward has a constant downward acceleration while going up, at the highest point and while falling down. To demonstrate this concept, a self-propelled fan cart system is used on a frictionless track. A quick push is given to the fan cart and it is allowed to move away on a track under the opposing action of thrust produced by the fan. The cart moves away from the starting point, stops at some distance away and then reverses its motion. Students frequently predict the acceleration of the cart to be constant during the round trip motion. When an experiment was performed, it was found that the cart acceleration was not constant during the round trip. After ruling out any equipment problem, the cart motion was analyzed using Newton's laws with the inclusion of retarding forces. Results showed that the total retarding force was more significant than previously assumed, and it reversed direction during motion. This analysis seems to offer a reasonable explanation for the discrepancy between prediction and observation. In addition, students learned that the discrepancy was due to a real physical effect, and not an artifact of the equipment. This analysis offers a problem solving opportunity in introductory physics laboratory.

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