

Abstract Submitted
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Rolling Resistance of Wheelchair Wheels on Rough Surfaces: A Student-Designed Undergraduate Research Project EDWARD HAMILTON, KAREN RISPIN, TYLER JOHNSON, LeTourneau University — Students at LeTourneau University have designed and constructed the CARRT (Continuously Adjustable Rolling Resistance Tester), a mechanical system for studying the coefficient of rolling friction for isolated wheelchair wheels under many varying configurations and conditions. We present initial results for data collected with three different models of wheels, for both front and back wheels, and for both rough and smooth surfaces. This data confirms the anticipated general result that the smaller front wheels have a higher rolling resistance, as well as more unpredictable results for the variation between wheel models. We also present a simple physical model utilizing introductory Newtonian mechanics concepts of friction and torque, offering a presentation easily understandable to any first-semester physics student.

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