



Science Virtual Learning

MPI Physics

Rotational Kinematics 6: Tangential Velocity

April 14, 2020

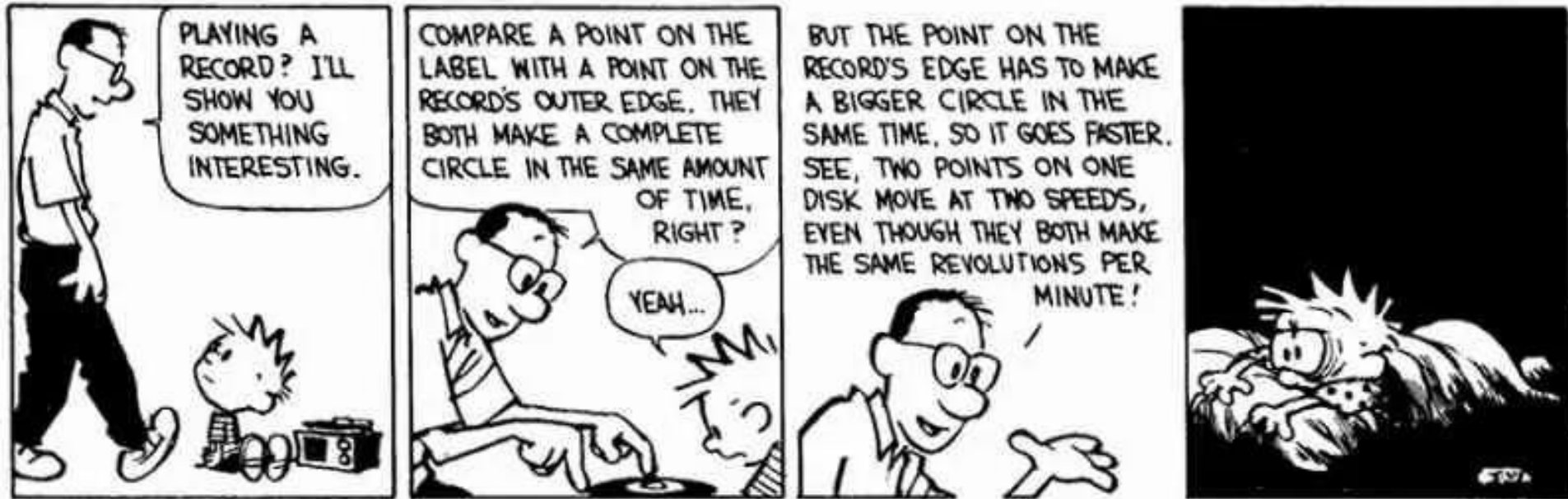


Lesson: MPI Rotational Kinematics 6 - Tangential Velocity

April 14, 2020

Objective: To understand the concept of tangential velocity, and how it is related to angular velocity

Tangential velocity in a nutshell:



- The following video discusses the relationship between the tangential velocity (in m/s) of a point on a rotating object, and its angular velocity (in rad/s).
- <https://youtu.be/MLeT0z0861Y>

Video: Tangential Velocity



- The following video shows two examples of solving problems using tangential velocity
- <https://youtu.be/MLeT0z0861Y>

Tangential Velocity Examples



- Here are the examples in words.
 - 1. A line of skaters is rotating in a wheel formation, once every 5.00 s. The innermost skater is 1.00 m from the center of the circle, and the outermost skater is 7.00 m out.
 - a) What is their angular velocity?
 - b) What is the linear velocity of the innermost and outermost skaters?
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Tangential Velocity Example 1



2. A car tire of radius 0.330 m is rolling with a linear velocity of 18.0 m/s. What is their angular velocity?

Tangential Velocity Example 2



Homework 1

The Earth has a radius of $6.38 \cdot 10^6$ m. A person on the equator spins with the Earth, making a circle of that radius once a day.

- a) What is the person's angular velocity?
- b) What is the person's tangential velocity?

- Try to solve the problem yourself, then watch the solution video:
- <https://youtu.be/uA1CMTGE6es>

Homework 2

The Flying Dutchman ride spins riders in a circle of radius 12.0 m. The riders have a tangential velocity of 15.0 m/s.

- What is its angular velocity?
- What is the period of its rotation?



- Try to solve the problem yourself, then watch the solution video:
- https://youtu.be/3_bxSYCAG5w



That's it!

