

PH 429: Reference Frames

Rocket from the North Pole

Use an inflated balloon or inflatable globe to represent the surface of the Earth (which is rotating at constant angular velocity). A rocket is shot from the North Pole. Assume there is no air resistance, and no left/right boosters on the rocket.

- Draw a point X on the equator.
 - Have one person rotate the globe at a constant angular velocity.
 - Have a second person draw the trajectory of the rocket as it is shot from the North Pole, initially aiming to fly over the heads of point X on the equator.
1. In the Earth's reference frame, the trajectory can be described by a Coriolis force. What direction does this force point?

 2. Continue the trajectory southward. What direction does the Coriolis force point?

 3. Will the rocket fly over the South Pole?

4. Is there a Coriolis force as the rocket passes the equator? How do you know?

5. Write 2-3 clear, coherent sentences about what you learned in this activity that you would like to remember in the future. Make your statement using good scientific writing, as you would in a research paper.

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