

Answer #87

The answer is (b): the ball will curve to the right in the rotating frame of reference, as seen in an mpeg video by clicking your mouse on the photograph below. The camera is mounted on the frame seen in the photograph.



This deviation of the path of the ball from the "normal" straight path as seen by an observer in the rotating frame of reference is known as the "coriolis effect." It occurs on the surface of the earth because the earth is a rotating and therefore non-inertial frame of reference. We on the earth are not particularly aware of our rotation, so we expect ballistic objects to move in straight lines in our reference frame, but they do not, for the same reason that the ball in this experiment curves.

In the northern hemisphere the coriolis effect causes an apparent deflection of a ballistic object to the right, the same as when our platform is rotating counterclockwise (as the view of the earth from directly above the north pole). The coriolis deflection is to the left in the southern hemisphere.

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