

PHY151H1F – Practice Problem Set 3

Ch. 14, Q. 36

36. An elementary particle is launched from Earth toward the Regulus system, 77.5 light years distant. At what speed relative to Earth must this particle travel to make this trip in 10 y in the reference frame of the particle? ●

Ch. 14, Q. 42

42. Describe the shape of the Moon as measured by an observer in a reference frame traveling past the Moon at a relative speed of (a) 1000 m/s, (b) $0.50c_0$, and (c) $0.95c_0$. ●●

Ch. 14, Q. 75

75. Relative to Earth, spaceship A travels at $0.732c_0$ away from Earth, and spaceship B travels at $0.914c_0$ toward Earth along the same straight line. (a) How fast does A move according to an observer aboard B? (b) At $t = 0$ the two ships are separated by 4.5×10^{10} m in the Earth reference frame. At what instant t do they pass each other according to an observer at rest on Earth? ●●