Answer on Question #52033- Physics-Quantum Mechanics

An observer can describe the motion of an object as "translational" if

the axes of the reference frame imagined to be attached to the object x', y' and z' always remain parallel to the axes of his own reference frame x, y and z

the object moves in a curved path in such a way that x', y' and z' may rotate about their origin O'

the motion of the object may not be represented by the motion of its center of mass

all the constituent particles of the object undergo different displacements at the same time

Solution

For translational motion:

$$x' = x + a_x, y' = y + a_y, z' = z + a_z,$$

where a_x, a_y, a_z are the components of translational vector. These components are constants. So,

$$x' - x = a_x = \text{const}, y' - y = a_y = \text{const}, z' - z = a_z = \text{const}.$$

Thus, an observer can describe the motion of an object as "translational" if the axes of the reference frame imagined to be attached to the object x', y' and z' always remain parallel to the axes of his own reference frame x, y and z.

Answer: the axes of the reference frame imagined to be attached to the object x', y' and z' always remain parallel to the axes of his own reference frame x, y and z.